

THE JOURNAL OF MEDICAL EDUCATION

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INFORMATION FOR CONTRIBUTORS

The Journal of Medical Education serves as an international medium for the exchange of ideas in medical education, as well as a means of communicating the policies, programs, and problems of the Association. The Editorial Board welcomes the submission of manuscripts concerned with the broad field of medical education; this includes preparation for medical education; the medical school experience; intern and resident education; graduate and postgraduate medical education. The Editorial Board recognizes that medical education includes the activities of faculty, students, administrators, and those of the practicing profession who also teach and learn. Thus, it invites communications from any of these sources.

Manuscripts should be submitted in duplicate. All manuscripts are reviewed by the Editorial Board before acceptance for publication. All copy, including footnotes, tables, and legends, should be typed double-spaced. Each diagram or graph or photograph should have a brief legend. Each table should be typed on a separate sheet of paper. References should refer to published material only, must be submitted in alphabetical order, and should include, in order: author, title, journal abbreviation (*Quarterly Cumulative Index Medicus* form), volume number, page, and year; book references should also include editors, edition, publisher, and place of publication.

Galley proofs will be mailed to authors for correction before publication and should be returned within 48 hours after receipt.

Reprints may be ordered, when galley proofs are returned, in multiples of 100, at a price depending on the length of the article; prices are listed on the reprint order form.

Medical Education Forum includes editorials, letters, comments, criticisms, and excerpts from important addresses.

News from the Medical Schools: Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

Items of Current Interest: Audio-visual news and notices from national and federal agencies appear in this section.

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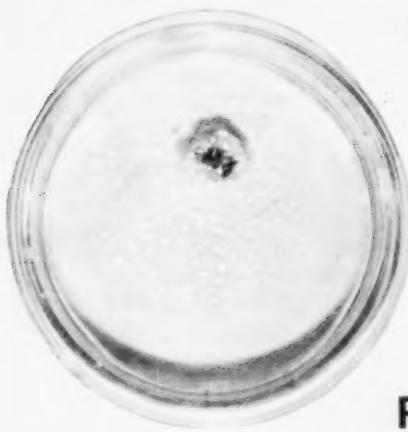
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Address all correspondence concerning news, announcements, and personnel exchange to the office of the Association of American Medical Colleges, c/o Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois; address all correspondence concerning advertising to Miss Helen Claire Herman, 2530 Ridge Avenue, Evanston, Illinois.

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LEVINE'S CARDIAC EMERGENCIES AND RELATED DISORDERS (New Book—1960)	By Harold D. Levine, M.D.
	Harvard Medical College, Boston
	<p>This book presents distinct plans of therapy and their mode of action in 17 chapters covering: Acute left ventricular failure; Cardiac shock; Cardiogenic chest pain; Pulmonary embolism and infarction; Refractory congestive failure; Electrolyte disturbances as cardiovascular emergencies; Digitalis intoxication; Atrial flutter, tachycardia with block, and fibrillation; Paroxysmal ventricular tachycardia; Adams-Stokes disease; Syncope; Cardiac arrest; Miscellaneous emergencies.</p>
	1960 368 Pages 47 Illus. \$12.00
FISCHER'S ENVIRONMENTAL PEDIATRICS (New Book—1960)	By Carl C. Fischer, M.D.
	Hahnemann Medical College, Philadelphia
	<p>The role of physicians in the solution of socio-pediatric problems is largely overlooked in pediatric texts. To fill this void the author presents this much needed information in chapters covering accident prevention, adoption, school health programs, problems of the handicapped child and the adolescent. The book is a supplementary text based on more than thirty years experience in private practice, and in teaching during which the subject was presented in a short course of talks to junior students.</p>
	1960 122 Pages 8 Illus. \$5.50
GRACE'S PRACTICAL CLINICAL MANAGEMENT OF ELECTROLYTE DISORDERS (New Book—July 1960)	By William J. Grace, M.D.
	Prof. of Clin. Medicine, N.Y. University
	<p>This small book is a guide to the bedside clinical management of electrolyte problems. It describes the clinical syndromes of electrolyte disturbances, briefly explains the mechanisms involved and specifies what can be done to correct them. In this respect it differs from other texts which are physiologically and chemically oriented and is therefore of practical usefulness to students, house officers and physicians. Illustrative case reports supplement the text.</p>
	July 1960 144 Pages 11 Illus. \$4.95
HYMAN'S ACUTE MEDICAL SYNDROMES AND EMERGENCIES (New Book—1959)	By Albert S. Hyman, M.D., et al.
	New York Medical College, N.Y.C.
	<p>A quick reference book dealing primarily with acute problems involving the heart, the gastrointestinal tract, the chest and the lungs. Relatively less space is given to diabetic and renal emergencies and to barbiturate poisoning. Common problems of diagnosis and treatment are covered in detail when clinically important. Where life and death issues are involved in prompt and correct diagnosis and treatment, the authors spare no effort to clarify each problem.</p>
	1959 442 Pages 7 Illus. \$8.75
VIGNEC'S EMERGENCY SYNDROMES IN PEDIATRIC PRACTICE (New Book—1959)	By Alfred J. Vignec, M.D.
	N.Y. University College of Medicine
	<p>The head of the largest pediatric in-patient service in the United States presents concrete assistance for handling the day-to-day emergencies of pediatric practice with common-sense, definitive, tested therapy. Separate chapters cover respiratory, gastrointestinal, hematopoietic, metabolic, cardiovascular, and central nervous system disorders, the steroids, poisons, allergy and the prematures. These therapies will help you to initiate immediate, vigorous and effective measures.</p>
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Potassium Penicillin V versus semi-synthetic penicillin

Recent clinical evidence sheds new light on some important questions...

Q. Which of the two oral penicillins has more anti-bacterial activity?

In a follow-up study¹ of oral penicillins, McCarthy and Finland compared the antibacterial activity of potassium penicillin V and semi-synthetic penicillin. They said: "Penicillin V provided greater activity than phenethicillin [semi-synthetic penicillin] against the streptococcus and pneumococcus, at least equivalent activity against the staphylococcus and sarcina in the serum and the same or greater activity in the urine . . ."

In another study², Griffith found that penicillin V not only produced peak levels of serum antibacterial activity faster, but produced values almost half again as high as those obtained with semi-synthetic penicillin.

A direct laboratory comparison³ by Abbott scientists revealed a measurable difference in activity, milligram for milligram, between the two penicillins *in vitro*. Against four pathogenic strains (staphylococcus, streptococcus, pneumococcus, and corynebacterium species), potassium penicillin V exhibited from two to eight times the antibacterial activity of semi-synthetic penicillin.

Q. How valid are blood levels as a basis for comparison?

In comment on the two penicillins, McCarthy and Finland state¹: "Thus, although the claim of better absorption and excretion and higher serum level of phenethicillin may be partly correct, strictly speaking, this is true in a very restricted sense and is therapeutically meaningless. Indeed the claim is misleading since it clearly implies greater antibacterial and presumably curative activity, which, in fact, the drug does not possess . . ."

Q. Are there useful differences in resistance to penicillinase?

In another recent report⁴, Geronimus commented: "Very large concentrations [of semi-synthetic penicillin] . . . were required to inhibit even so-

called moderately penicillin-resistant staphylococci when populations were employed that approached those found *in vivo*. Inferences regarding the possible effectiveness of phenethicillin in infections by penicillinase-producing staphylococci drawn by others from experiments with relatively minute inocula were found to be unwarranted."

McCarthy et al.⁵ reached a similar conclusion: "Both of these penicillins [potassium penicillin V and phenethicillin] are qualitatively similar to penicillin G in their susceptibility to penicillinase produced by *Staphylococcus aureus*."

At Abbott, investigators studying the same subject³ found that the rate of destruction of all three penicillins was so great that any differences were of no therapeutic significance.

Q. How does the safety of oral penicillins compare?

While surveys⁶ have established that oral penicillin produces fewer and less severe reactions than does injectable penicillin, to date no clinical studies have produced any evidence that one oral form is less allergenic than another.

Q. What about recent editorials on oral penicillin?

Recently, *New England Journal of Medicine* editorialized⁷: "It thus appears that the major claims of phenethicillin over penicillin V are not well founded. More data are needed to permit a complete comparison of these and other penicillins, particularly in their effects on infections caused by penicillinase-producing staphylococci, but it is fair to say that the new, so-called synthetic penicillin possesses no demonstrated virtue of importance that should impel one to choose over other available forms."

And in England, where semi-synthetic penicillin was first discovered and marketed, *British Medical Journal* editorialized⁸: "There is no evidence of any activity superior to that of other penicillins against Gram-negative species, and what differences there are against sensitive species are in favour of penicillin G or V or both; this applies to all varieties of streptococci tested."

Q. What are the benefits of Compocillin-VK?

Compocillin-VK is Abbott's potassium penicillin V. It offers early, high concentrations of serum antibacterial activity against penicillin-sensitive organisms. Following appropriate doses, initial activity levels are higher than those obtained with intramuscular penicillin G. Available in easy-to-take forms for any age: tiny Filmtab® tablets, 125 mg. and 250 mg.; or as granules for tasty cherry-flavored Oral Solution.

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1. McCarthy, C. G., and Finland, M., *New England J. Med.*, 263:315, Aug. 18, 1960. 2. Griffith, R. S., *Antibiot. Med. & Clin. Therapy*, 7:129, Feb., 1960. 3. Laboratory Records, Microbiology Dept., Abbott. 4. Geromini, L. H., *New England J. Med.*, 263:315, Aug. 18, 1960. 5. McCarthy, C. G., Hirsch, H. A., and Finland, M., *Proc. Soc. Exper. Biol. Med.*, 103:177, Jan., 1960. 6. Welch, H., Lewis, C. N., Weinstein, H. I., Boeckman, B. B., *Antibiotics Annual*, 1957-58, p. 296. 7. Editorial: *New England J. Med.*, 263:361, Aug. 18, 1960. 8. Editorial, *Brit. M. J.*, 2:940, Nov. 7, 1959.

Calendar of Meetings

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

72nd Annual Meeting, Nov. 13-15, 1961
Queen Elizabeth Hotel, Montreal, Canada

1961

FEBRUARY

AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, Feb. 23-25. Dr. W. J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary-Treasurer.

MARCH

AMERICAN ASSOCIATION OF ANATOMISTS, Pick-Congress Hotel, Chicago, Mar. 21-24. Dr. Louis B. Flexner, Dept. of Anat., School of Med., Univ. of Pa., Philadelphia 4, Secretary-Treasurer.

AMERICAN COLLEGE OF ALLERGISTS, Statler Hilton, Dallas, Tex., Mar. 12-17. Dr. Howard G. Rapaport, 16 E. 79th St., New York City, Secretary.

AMERICAN COLLEGE OF SURGEONS, SECTIONAL MEETINGS FOR SURGEONS AND GRADUATE NURSES, Hotels Bellevue-Stratford, Ben Franklin, and Sylvania, Philadelphia, March 6-9. Dr. William E. Adams, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Statler Hilton, New York City, Mar. 23-25. Dr. Marion F. Langer, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN SURGICAL ASSOCIATION, Boca Raton Hotel, Boca Raton, Fla., Mar. 20-24. Dr. W. A. Altemeier, Cincinnati General Hosp., Cincinnati 29, Ohio, Secretary.

NATIONAL HEALTH COUNCIL, NATIONAL HEALTH FORUM, "HEALTH AND COMMUNICATION", Waldorf-Astoria, New York City, Mar. 13-16. Mr. Philip E. Ryan, 1790 Broadway, New York 19, Executive Director.

NEUROSURGICAL SOCIETY OF AMERICA (members and guests), Boca Raton, Fla., Mar. 8-11. Dr. Raymond K. Thompson, 803 Cathedral St., Baltimore 1, Secretary.

APRIL

AEROSPACE MEDICAL ASSOCIATION (32nd annual meeting), Chicago, Apr. 24-26. Dr. Willion J. Kennard, c/o Washington National Airport, Washington, D.C., Secretary-Treasurer.

AMERICAN ACADEMY OF GENERAL PRACTICE, Miami Beach, Fla., Apr. 13-20. Mr. Mac F. Cahal, Volker Blvd., at Brookside, Kansas City 12, Mo., Executive Director.

AMERICAN ACADEMY OF NEUROLOGY (members and guests), Sheraton-Cadillac Hotel, Detroit, Apr. 27-29. Mrs. J. C. McKinley, 4307 E. 50th St., Minneapolis 17, Executive Secretary.

AMERICAN ACADEMY OF PEDIATRICS, spring meeting, Sheraton-Park Hotel, Washington, D.C., Apr. 10-12. For information write Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Executive Director.

AMERICAN ASSOCIATION OF PATHOLOGISTS AND BACTERIOLOGISTS, Chicago, April 26-28. For information write: The Internsociety Committee on Pathology Information, 1785 Massachusetts Ave., N.W., Washington 6, D.C.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Sherman Hotel, Philadelphia, Apr. 24-26. Dr. Hiram T. Langston, 308 Carondelet Bldg., 7730 Carondelet Ave., St. Louis 5, Secretary.

AMERICAN COLLEGE HEALTH ASSOCIATION, Detroit, Apr. 26-29. Dr. Norman S. Moore, Cornell University, Gannett Clinic, Ithaca, N.Y., Secretary-Treasurer.

AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS, Americana Hotel, Miami Beach, Fla., Apr. 21-28. Mr. Donald F. Richardson, 79 W. Monroe St., Chicago 3, Executive Secretary.

AMERICAN FEDERATION FOR CLINICAL RESEARCH, Hadson Hall, Atlantic City, Apr. 30. James E. Bryan, 250 W. 57th St., New York 19, Executive Secretary.

AMERICAN PHYSIOLOGICAL SOCIETY, Atlantic City, N.J., Apr. 10-14. Mr. Ray G. Daggs, 9650 Wisconsin Ave., Washington 14, D.C., Executive Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, INC., Chalfonte-Haddon Hall, Atlantic City, Apr. 29-30. Joan K. Erpf, 265 Nassau Rd., Roosevelt, N.Y., Executive Assistant.

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC., Atlantic City, Apr. 10-14. Mr. Frank W. Putnam, University of Florida College of Medicine, Department of Biochemistry, Gainesville, Executive Secretary.

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, Atlantic City, Apr. 10-14. Dr. J. F. A. McManus, Univ. of Alabama Med. Center, Birmingham, Ala., Executive Secretary.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Bizon-Plaza, New York City, Apr. 17-20. Dr. Edward C. Hinda, P.O. Box 20068, Houston 25, Texas, Secretary-Treasurer.

U. S. PUBLIC HEALTH SERVICE CLINICAL SOCIETY, U. S. P. H. S. Hospital, Lexington, Ky., Apr. 5-8. Dr. John H. Waite, President of the National Chapter, U. S. Public Health Service Clinical Society, U. S. P. H. S. Hospital, P. O. Box 3145, Seattle 14.

MAY

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE, Shoreland Hotel, Chicago, May 18-20. Dr. John B. Blake, c/o Smithsonian Institution, Washington 25, D.C., Secretary-Treasurer.

AMERICAN COLLEGE OF CARDIOLOGY, INC., Biltmore Hotel, May 16-20. Dr. Philip Reichert, 350 Fifth Ave., Empire State Bldg., New York 1, Executive Director.

AMERICAN COLLEGE OF PHYSICIANS, Americana Hotel, Miami Beach, Fla., May 8-12. Dr. Edward C. Rosenow Jr., 4200 Pine St., Philadelphia 4, Executive Director.

AMERICAN GASTROENTEROLOGICAL ASSOCIATION, Drake Hotel, Chicago, May 25-27. Dr. Wade Wolviler, Dept. of Med., Univ. of Washington, Seattle 6, Secretary.

AMERICAN ORTHOPAEDIC ASSOCIATION (members and guests), The Ahwahnee, Yosemite, Calif., May 22-25. Dr. Lee Ramsay Straub, 535 E. 70th St., New York 21, Secretary.

AMERICAN PSYCHIATRIC ASSOCIATION, Morrison Hotel, Chicago, May 8-12. Dr. C. H. Hardin Branch, 156 Westminster Ave., Salt Lake City 15, Utah, Secretary.

AMERICAN UROLOGICAL ASSOCIATION, INC., Biltmore Hotel, Los Angeles, May 22-25. Mr. William P. Didusch, 1120 N. Charles St., Baltimore 1, Executive Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Chalfonte-Haddon Hall, Atlantic City, May 2-3. Dr. Paul B. Beeson, Yale University School of Medicine, New Haven 11, Conn., Secretary.

New 1961 Book!

THE HUMAN ADRENAL GLAND

By LOUIS J. SOFFER, M.D.

Attending Physician and Head of Endocrinology, The Mt. Sinai Hospital; Clinical Professor of Medicine, State University of New York College of Medicine

RALPH I. DORFMAN, Ph.D.

Director, Worcester Foundation for Experimental Biology,
Shrewsbury, Massachusetts

and J. LESTER GABRILOVE, M.D.

Assistant Attending Physician and Member of Endocrine Research Laboratory and Clinic,
The Mt. Sinai Hospital; Clinical Assistant Professor of Medicine,
State University of New York, College of Medicine

Three highly qualified authors combine their talents to bring you this comprehensive work on the anatomy, physiology and chemistry of adrenal hormones, and the diagnosis and treatment of diseases of the adrenal glands. Emphasis is on the clinical aspects, but theoretical as well as practical viewpoints are included. All of the adrenal hormones, including medullary and cortical, and the synthetic analogues, are considered fully in this compact book. Adrenal insufficiency is covered extensively, with an additional chapter on treatment.

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DIAGNOSIS IN CLINICAL PSYCHIATRY

By THOMAS A. LOFTUS, M.D.

Associate Professor of Clinical Psychiatry,
The Jefferson Medical College, Philadelphia

The meaning of diagnosis, how to evaluate patients properly and how to guide them with effective, proved diagnostic procedures are explained fully in this excellent book. In addition to fundamentals, Dr. Loftus includes full discussions in the area of psychotic behavior and the use of drugs in diagnosis. Readers are asked to list the signs and symptoms of psychopathology as presented in several case histories, and to suggest diagnosis. Answers are given in the Appendix. The text reflects the author's teaching experience in both graduate and undergraduate courses. It has special application to the resident level of instruction.

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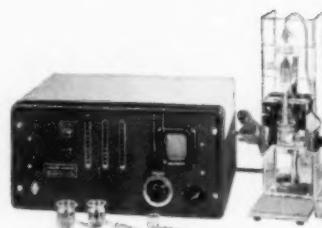
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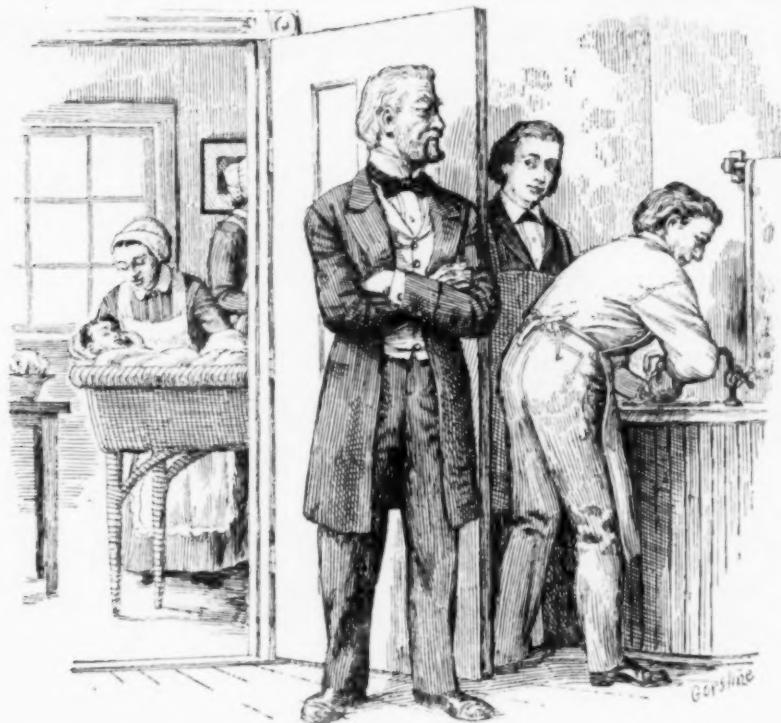


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In 1846, puerperal fever was considered an unfortunate consequence of childbirth. When Ignaz Semmelweis assumed his duties as assistant to the Chief of the First Obstetrical Clinic in Vienna, he noted that the Second Clinic, operated by midwives, lost far fewer patients. Seeking an explanation, Semmelweis and his students dissected the fatal fever cases, then returned to the wards to examine more women. The result of his zeal—an increased death toll! During one autopsy, Semmelweis' friend, Dr. Kolletschka, was nicked by a student's scalpel—and died exhibiting all the indications of puerperal fever.

Now at last, with this experience, Semmelweis perceived the danger of transferring contaminants and posted this notice at the door of his clinic: "As of today, May 15, 1847, every

doctor and student who comes from the dissecting room is required, before entering the maternity wards, to wash his hands thoroughly in a basin of chlorine water. . . ." Semmelweis himself stood guard over the clinic and soon became a hated tyrant. But when the rapid decline in fatalities drew the attention of the Vienna Medical Society, his superior, Prof. Klein, fearing such a triumph for his young assistant, denounced Semmelweis as a traitorous revolutionary. Semmelweis, barred from the hospital, died in despair and obscurity. During the same year, 1865, Joseph Lister began his crusade for antisepsis.

—JURGEN THORWALD: *The Century of the Surgeon*, New York, Pantheon Books Inc., 1957, pp. 227-243.



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Immediate Problems for Medical Educators*

Third Alan Gregg Memorial Lecture

JOSEPH T. WEARN, M.D.†

Western Reserve University, Cleveland, Ohio

The honor of being asked to give the third Alan Gregg Lecture is a great one indeed. There is a further and deep meaning for me in that he was a friend, from the days when we were in medical school together to the time of his death. Through more than 40 years we had many visits, always with informal, fruitful discussions of policies, problems, and men, wide-ranging at times, and especially in the fields of research and patient care. The warmth of his personality and his readiness to give of his time and counsel, I am sure, have been experienced by many of you.

One of Alan's favorite ways of opening an informal discussion with an individual or a group was to present a problem and ask for opinions, but he rarely let the chance go by to express his own.

Tonight I propose to mention a few pressing problems that are facing medical educators, and present my views on three of the most important ones.

It is not necessary for me to tell you that it is lack of time, not lack of problems, that leads to this limit of three.

During the first quarter of this century the union which was consummated between medical schools and the universities resulted in a golden age of medical science and rapid developments in both our preclinical and clinical departments.

Whole groups of diseases have disappeared, either through prevention or effective therapy. Our more profound understanding of basic mechanisms has made possible great improvements in medical care. Our teaching wards are now populated by much older patients, and their diseases are preponderantly chronic in nature. The spectrum of disease available on the wards for teaching is growing steadily narrower, and even the occupancy rate of ward beds in our teaching hospitals is declining.

Since World War II there has been a phenomenal growth in the volume of research, in the construction of research facilities, and in the traineeship programs for research personnel. Indeed, the status of research is such that our young men cannot be blamed if they believe it is now the principal avenue to academic advancement.

During these same years when medical educators have been devoting so much energy to scientific research, patterns of medical care have been changing rapidly. Health services have become increasingly complex because of the trend to more and

* Presented at the 71st annual meeting of the Association of American Medical Colleges, on October 31, 1960.

†Formerly Vice-President for Medical Affairs. At present, consultant in Medical Affairs, Harvard Univ. Medical School, and at Western Reserve Univ.

more specialization in medicine and the entry of disciplines, outside of, but related to medicine, into the health field. Communication between the general physician, the various medical specialists, and the other health disciplines, is often difficult.

Medical schools, then, are beset by problems. I have only mentioned some which are familiar to all of you. My purpose is to emphasize that the time has come when medical educators must face their responsibilities, define their goals specifically, and set an orderly course toward them. If we fail to take the helm and steer a clear course, others will be only too ready to seize the initiative. With this in mind, I propose to discuss three problems which, because of their importance and scope, call urgently for our careful attention. These are (*a*) the adaptation of medical education to our expanding scientific knowledge, (*b*) the delicate balance of research with teaching and patient care, and (*c*) the relation of university medical centers to medical care for the whole community.

The adaptation of medical education to expanding scientific knowledge.—Because the mass of medical knowledge is steadily increasing it is generally agreed that complete coverage is beyond the capabilities of faculty and students. Educators have been forced to pay more attention to selection of curriculum content and to more efficient methods of presenting what they consider essential. To any one faculty member, abandonment of complete coverage is acceptable if it means that the time allotted to his colleagues is cut in order that he may have more for the presentation of his own subject. For students, abandonment of coverage is often a source of frustration and anxiety, because unhappy specialists keep telling them they are not learning all they need to know; but this is probably no worse for them than their

uncertainty as to just which "essentials" they should select from the overwhelming mass which is presented when all their teachers, without any restraint, make their specialized demands upon them.

Time is precious for both teacher and learner. We must recognize the importance of defining our requirements and our objectives, and of devising more adequate methods for appraisal of both teacher and student performance.

The defining of absolute essentials, especially for students in the first 2 years, is of prime import. The faculty is certainly better qualified for this selection than the students. We must recognize that either the teacher provides a definition on the basis of his knowledge and experience, or the student without experience guesses at what is essential. What one hopes for is that spoon feeding can be avoided by the wise instructor who can guide the student in the selection of the essentials on which to focus his main effort, and then can inspire him to use his own initiative and enthusiasm in pursuit of advanced knowledge in areas where the student has special interest and aptitude.

If essentials can be reasonably defined, there should be a change in the appraisal of student performance. The word "essentials" implies that the student must master 100 per cent, not 60 or 75, before he is advanced to greater responsibilities. Once the student has mastered the clearly defined essentials, opportunities should be available to encourage the more able students to develop and go as far beyond the minimum requirements as their capacities permit.¹

It has long been the goal of medical educators to send out graduates who would continue their studies and keep abreast of advances in their profession.

¹My colleague Dr. John L. Caughey has written in more detail on this subject (*J. M. Educ.*, 34:581, 1959).

It now becomes imperative that we instill into students not only the necessity, but also a real desire, to continue their learning, and it follows that, in order to accomplish this, they must have acquired sufficient scientific critique to select wisely from the ever-increasing mass of knowledge.

How can these problems be approached? How can teachers stimulate in students a continuing desire to learn? Perhaps this might best be accomplished by taking a leaf from the book of those responsible for the magnificent advances in scientific medicine over the past half century. What we need is a clear definition of our problems, suitable methods for data collection, accurate observations, and controlled study to test the hypotheses which we formulate. In short, more research in medical education is greatly needed. It is already under way in some schools, and, in at least two, Divisions of Research in Medical Education have been set up. Perhaps the most effective stimulus to the medical schools in recent years has been the leadership of the Association of American Medical Colleges. Its studies of these problems, of the medical student and his progress through medical school, and the Teaching Institutes have set an admirable example. The Association's success in bringing medical educators together for intimate discussion of educational problems is a great tribute to the officers and staff. The investigative road in medical education will not be a smooth one, because methods must be devised, controls are difficult, and medical faculties have long enjoyed the reputation of being resistant to change. However, the factual presentation of the results of studies in medical education will stimulate others to investigate, and eventually we may even hope for objective and constructive criticism in this field, which is not altogether common today. Some of our best pre-

clinical and clinical scientists, whose objectivity is unquestioned in the laboratory and in their presentations of their work, lose all trace of that objectivity when they discuss educational problems and exhibit a degree of emotional bias that would do credit to a Maine Republican or a South Carolina Democrat.

University schools of education, technical schools, and liberal arts colleges are facing the same problems and are actively searching for methods of appraisal of teacher and student, but in some areas medical education is as far advanced as any. If we can keep and cultivate our capacity for research and submit our activities to constant reappraisal by means of a carefully planned research program, we can hold our position, move ahead, and perhaps even contribute to the solution of educational problems in other fields.

The balance of research with teaching and patient care.—Since World War II the budgets for research in our medical schools have increased at an astounding rate. New scientific journals have been established, and many of the older ones have increased their size. Numerous research training programs have come into being, and research fellowships have multiplied rapidly. You are well aware that this great increase in research and in training of investigators has been made possible to a considerable extent by financial support from the Federal Government. Fortunately for the medical schools, the policies of administering these enormous programs have been wise ones from the beginning. The governmental agencies have selected their advisory committees almost entirely from the faculties of the country's medical schools, and these agencies are to be congratulated on their convincing demonstration that the government can finance such large programs without unnecessary controls. This is a blessing, but it

carries with it temptations which have been so well described recently by Dr. A. N. Richards² that I shall quote his remarks to you: ". . . ready access to abundant research funds is associated with subtle temptations not easy to recognize and resist.

"Those are the temptations to ask for more than is needed or justified; to overestimate the influence of volume of results, perhaps at the expense of quality; to delegate too much of the work to assistants or technicians and thus for the investigator to be deprived of opportunity of seeing the chance breaks which nature so frequently yields. There is also the temptation to shape the plan of research to suit what are believed to be the aims of the granting agency or to the peculiarities of expert advisers; the temptation to forget that a reasonable degree of austerity is a wholesome stimulant; that excessively elaborate equipment can convert the investigator into a technologist and may obstruct his direct vision of the living system which he studies and of its beauties; that discoveries are usually made, not by teams, but by an individual, lonely and tormented by a passion to break through the blank wall which stands in the way of his understanding."

An estimate of the possible continued growth of research in the future is to be found in the 1958 report on "The Advancement of Medical Research and Education" by the committee under the chairmanship of Dr. Stanhope Bayne-Jones, which envisions an increase in funds for medical research from \$330 million in 1957 to one billion dollars by 1970. This means, of course, that research facilities must be greatly augmented and that the necessary research workers must be

²A. N. Richards. Remarks made at the dedication of The Alfred Newton Richards Medical Research Building (*Bull. Univ. Pennsylvania*, 1959).

trained to man this program. What does this mean to the medical educators in this country? It is generally admitted that rapid growth of almost any research project beyond a given size tends to make it more and more unwieldy, more difficult to administer, and less efficient. There is grave doubt that growth in quantity of research is desirable unless it is possible to assure that there will be maintenance of quality, or better still, an improvement in quality of the research. The present medical schools must expand their facilities or new medical schools must be built to make the suggested increase of research possible. The task will fall squarely on the shoulders of medical schools. This immediately poses the question whether we are prepared to meet this challenge. Do we now have or can we mobilize an adequate research staff for such an increase? Are we in a position financially to undertake this task? And of equal import, will this additional growth of volume of research completely upset that balance of teaching, medical care, and research that is so essential in our schools today? Before answering the staff question, one must look carefully at the distressing number of vacancies that exist in medical faculties today. As long as key teaching positions remain unfilled one must question the wisdom of attempting expansion, lest standards be sacrificed. It is not my intention to say that this can or cannot be accomplished. Each school must appraise its own desires and capacities for expansion of its research volume. The availability of large sums of money for research should certainly not be the sole determining factor. It is imperative that we begin immediate planning, define our responsibilities, and take steps to meet them. This Association enjoys the confidence of the schools and can furnish the necessary leadership, but it will need the unified support and unstinted effort of the medical educators

of this country to deal with this problem successfully.

In considering the financial position of medical schools it might be said that, by whatever formula used, it has been shown that medical schools lose money on all research contracts that do not cover all direct and indirect costs. Hence, the greater the research budget, the greater the drain on the free funds of the schools, or in plain words, the greater the deficit. As you are aware, the officers of this Association have waged a steady battle to persuade the Congress to meet this issue and support both direct and indirect costs of research. Progress has been made, but the question is not yet settled, and until it is the wisdom of increasing medical school deficits may well be questioned.

We must also consider the desirable balance of teaching, medical care, and research. This is frequently referred to in terms of the three-legged stool, of which all three legs are essential if the stool is to stand. We must remember that, if one leg is allowed to grow inordinately at the expense of the others, the balance is destroyed. A sound, productive research program is a *sine qua non* for a living medical school, but its value can be questioned if its growth becomes uncontrolled at the expense of quality or at the expense of teaching and care of patients. In short, if an increase in the volume of research is to occur, then let us plan carefully for staffing, for facilities, and for financing it, but at the same time control it so that its growth is reasonable in relationship to its environment.

Medical care for the whole community.

—The third problem that calls for more intensive study on the part of medical educators is that of whether we are meeting our responsibilities in educating the physician adequately for his role in health service to his community.

In the earlier days of this country practically all medical school faculty members were in the closest touch with community needs in health care, because they themselves were the leading practicing physicians of the community. However, as the medical schools have allied themselves with universities and with university hospital centers, the emphasis has shifted, and full-time positions have been created which have permitted and encouraged clinical teachers to devote themselves to research at the preclinical and clinical levels. This brought new life into the schools and resulted in the great increase in medical knowledge which has made it possible for this country to have the highest standards of medical care.

As more full-time research and teaching positions became available in clinical departments, these faculty members gradually lost their intimate association with the patterns of health service in the community. There is no doubt that the practice of these full-time men is often of the highest quality and exceptional in its ability to deal with the most complex medical problems; but insofar as it is dependent on the unique facilities of the great medical center, it is isolated from practice in the community.

By evolution, therefore, academic medicine has actually become a specialty itself and competes with other areas of medicine in trying to attract young physicians to it. This is natural and desirable as long as the academic medicine specialists have, and impart to their students, an appropriate respect for the pursuit of excellence in other careers in medicine, and as long as they use with self control the enormous advantage they have because they control access to all careers in medicine, not just access to their own specialty.

What we must ask ourselves, then, is whether in pursuing our own specialty of academic medicine we are keeping in

close enough touch with the fast changing patterns of health service in the community. We must consider whether medical faculties, intent upon their own research, teaching, and care of patients in university hospital centers, have become less familiar than they should be with all the other aspects of health service for which their students after graduation must eventually assume responsibility.

Inasmuch as this is an educational problem in medicine, there can be no doubt that the obligation for its solution lies with medical educators. Lay groups are becoming increasingly interested in these problems of health service, and are already active with plans of their own.

It behooves us, therefore, to face this problem without delay, to shoulder our responsibilities, and to plan to meet them. Fortunately, we do have some evidence that research techniques can be applied to studies of methods and patterns of medical care. Medical educators must see to it that these techniques are applied objectively and that the results are used as a basis for planning improved educational programs.

If we keep before us the fact that, as medical educators, we teach today the physicians not of tomorrow but of the

next several decades, we will see that we must plan far ahead in order to equip our graduates to meet the challenges which will result from continuous increase in medical knowledge, from changing patterns of medical care, and from unpredictable economic and social progress. We must accept our responsibilities unequivocally, define our goals, and set our course. Above all, we must keep and cherish the capacity for change which has enabled medical education to adapt to vast changes in its capabilities and opportunities.

Today the battle to create a scientific foundation for medicine, to which Alan Gregg contributed so mightily, has already been won. Our greatest challenge is to develop educational programs and health service mechanisms which will assure that the products of our expanding scientific research will be applied promptly and effectively, in comprehensive care of patients in every community, not just in our most elaborate university medical centers.

This is the concept of Great Medicine with which Alan Gregg challenged this Association when he addressed its Annual Banquet in 1952. The challenge is still before us, the need to meet it is urgent, but our time is running out.

Professional Practice and Medical Education*

JOHN ELLIS, M.D. †

London Hospital Medical College, University of London, London, England

It has been said that "neither a previous Education alone, nor Practice alone can complete the Physician." This statement, like the majority of those made about medical education, is not backed by scientific proof: it is based on empirical knowledge, and resembles a clinical judgment. It is also common sense and is none the worse for that. It could well have been made by any American medical educator of this century, but it was in fact made by an Englishman in 1759.

His name was Richard Davies, and I doubt if he is remembered on this side of the Atlantic, for in his time the people of this country were somewhat preoccupied with local affairs, preparing for what my 11-year-old son recently called the War of the Independents (a nice tribute, I think, from one whose knowledge of America is limited to contact with traveling Americans, many of whom are here today).

The name of Richard Davies, one-time fellow of Queens College, Cambridge, and contributor to knowledge of the circulation, is seldom remembered in his own country—which should be a warning to any here who seek a place in the annals of posterity—for he, too, was primarily engaged in attempting to reform medical education.

It was his contention that technical or vocational training in medicine can be of full value only when a sound education

has first been received, "because," he argued, "men may grow old in Practice without a capacity to form Experience, which, in the philosophic sense, is the knowledge of Truths established by repeated experiments."

He was convinced that education in medicine should be an exciting process of scientific discovery. He hoped that students who learned in this way would go on, by future experiment, to add to our store of knowledge. Students should be encouraged, he advocated, to study the science of life, which he called "Nature." For this purpose special schools should be established in the universities, with an adequate number of professors, and not only books but instruments should be supplied to enable them to carry on "every species of Enquiry." He added that the most ingenious youths should be distinguished by honorary awards.

"It is the general fault of scholars," he said, "to read Books too much and Nature too little. By the one we can keep possession of the Truths discovered by our predecessors, by the other we are continually making new acquisitions and by our knowledge extending the empire of man over nature. Each province, both of Learning and Knowledge, should be regularly supplied—nor can any expense be too great for (them), since to (them) is owing the principal difference and distinction between a polite and learned nation and the savage inhabitants of the American woods."

We must all acknowledge, however, that in this century it has been the Americans who, more than anyone else, have stressed the importance to the doctor of a sound education in science. It is they

* Presented at the 71st Annual Meeting of the Association of American Medical Colleges, Hollywood Beach, Florida, October 31, 1960.

† Secretary, Association for the Study of Medical Education.

who have gone further, in the average school and for the average student, toward providing the opportunity to learn by active participation in experiment—believing, with Dr. Davies, that "the knowledge we gain by these means is more our own, makes a deeper impression on the understanding, and more enlarges the mind than any other—that at this time of life (our youth) we are most ripe and vacant for these researches."

I do not draw attention to this similarity between modern American educational policy and that of a long dead Englishman in order to suggest that you have merely developed an English concept. I am conscious of, and grateful for, the fundamental discoveries of the Americans—particularly the doughnut. Nor is it my purpose to give unnecessary and unctuous backing to those beautiful words in Ecclesiastes—"All is but Vanity, saith the Preacher, and there is nothing new under the sun."

I wish to stress the fact that the mid-18th century and the early 20th have this in common: that, in both, medical knowledge and medical skill advanced very rapidly. In such times medical education also has to change or be changed. In that earlier period Richard Davies stands as an example of a man who, firmly believing that medical education was of the utmost importance, therefore gave it his best and undivided attention. In this era it is, I think, you in the United States, who, with the same motives, have more than anyone else put good minds to work in search of the right answers to the problems of preparing men for the safe and full future practice of a rapidly changing medicine. Because both then and now so little is really known about education itself, it remains a subject on which only clinical judgements can be made, based on clear thinking and the knowledge of past experience. It is therefore not surprising, but is important and

encouraging, that there should be this similarity between your views and those of Richard Davies.

Yet these same views are to many British ears at this very time somewhat revolutionary. The reason for this is not hard to find. It is that soon after the time of Davies medical education in Britain became wholly subservient to medical practice and has since danced attendance on the hospital form of it.

It is true that reforms which he advocated in education came into effect in the universities, of which there were then but two: Oxford and Cambridge. They became as capable as any of offering a sound education in science to any medical student, and by and large have so remained. They were never concerned, however, with the practical training of the doctor. There has never been a clinical school at Cambridge, and that at Oxford began only after this last war.

In the time of Davies a physician (internist) was required to follow his university education with an apprenticeship before he could be licensed to practice by Oxford or Cambridge or by the Royal College of Physicians of London. Surgeons also had to serve an apprenticeship, but they were not, of course, required to be educated first. During the life of Davies, however, hospitals were built in large numbers—and were well built, for most of them are still in service today, 200 years later. Into them congregated physicians and surgeons alike, to the mutual benefit of both. Such places, or rather the men in them, were attractive to the young who were able to get a better apprenticeship within them than they could outside. Davies himself was impressed with the opportunities offered and had but one reform to suggest in regard to practical training—namely, that it could be "improved by due (and required) attendance at some public hospital, which ought to be

the *finishing school* of the clinical physician."

It was not long, of course, before the staff of these hospitals set about organising this clinical training, and in 1783 there was announced the foundation of the London Hospital Medical College, the first of Britain's hospital medical schools.

The official history of the London Hospital reports that the staff were given permission to erect a proper building for teaching in the Hospital grounds. The staff asked that Donors of Thirty Guineas to this building might be made Governors of the Hospital. The Hospital Governing Committee would not agree. "Thus," continues the official history, "from the first the Committee decided that the cost of treating patients and the cost of educating medical students must be kept entirely separate." It could add, with truth, that from the first the Committee, not unnaturally, considered that it was concerned only with the treatment of patients and not with the education of students.

Elsewhere, in London, and the provinces, the story was, of course, the same. Before long we had in action 24 of the 26 Teaching Hospitals which we have today. In these places blossomed the new science of morbid anatomy, and from its fruit grew that medicine which, concerned primarily with *structural* disease and its treatment, flourished until in our own century the flowering of biochemistry turned attention once more toward bodily and mental *function*. For well over 100 years, with the exception of the Public Health Service, British medicine was predominantly, if not exclusively, concerned with the diagnosis and treatment of organic disease. The physical sign became of greater importance than the symptom; and the autopsy room was the Palace of Truth, the whole Truth, and nothing but the Truth.

Once any major change in the direction

of medicine has taken effect, there is inevitably a change in the pattern of medical care. The change which I have described brought into being in Britain the general practitioner: a man who could do everything, a practical man combining the functions, hitherto separated, of internist, surgeon, and obstetrician, and also the first family doctor—the first personal doctor. When in doubt he consulted a consultant, a particularly good or successful man of his own kind. These consultants taught the students by the method of apprenticeship in the hospitals, and inevitably there evolved quite rapidly a clinical training which had but one object—the production of a good general practitioner. It was a strictly utilitarian training, demanding a high standard of clinical skill. Its authoritarian method of instruction was well suited to the empirical medicine which was all that could be taught.

Thus, although education for future doctors was reformed in the two universities, *clinical training* in the hospitals became the dominant force. The hospital medical schools received the students from Oxford and Cambridge but also took a far greater number to whom they gave a vocationally oriented and rather brief grounding in anatomy and physiology before entering them upon their practical course. Even when other universities were founded and each took under its wing a hospital medical school, the practising consultants continued to train the medical students in autonomous isolation and with little alteration in their teaching by virtue of their own newly acquired and very nominal academic status.

When the University of London was founded just over 100 years ago, she was blessed with some twelve long established medical schools—too many to nestle comfortably under even her large wings, so they have stayed close to their parents,

the teaching hospitals, and have not paid over-much attention to their foster mother except perhaps at feeding times.

This system of medical care and medical education had fully evolved in Britain by 100 years ago. It would be wrong to infer that it was anything but successful. The form of medical training was appropriate to the pattern of practice, and that pattern was suitable to the medicine of the time, so that all knowledge could be applied effectively and ethically. The standard of medicine was as high as the degree of knowledge would allow, for medicine was in balance. Yet when pattern of practice and form of training were both fixed by the law of the land in 1858, 99 years after the writings of Richard Davies which I have quoted, the education which he had advocated was almost entirely excluded. The "finishing school" of practical training in the hospital had become the whole school, and a university education had become the privilege of only a fortunate few. Nevertheless this did not greatly matter, so long as medicine remained much the same and largely empirical. It did so remain, with training and practice in balance, till quite recently. Now, of course, in our century medicine has changed again, under the stimulus of new knowledge springing rapidly from new growing points and of an alteration in the incidence of disease. Technical advance has demanded specialisation, which has itself increased the speed of technical advance. These advances have passed rapidly into practice and changed the pattern of it. The change of practice in the hospital has altered medical education, but not in such a way that balance has been restored. In all countries medicine is struggling to find a new pattern in which the profession as a whole can effectively wield its new power and tackle its new problems, within the confines set by social and economic circumstances. In most coun-

tries the old pattern of the profession has dissolved before a new has evolved. However in Britain the old pattern remains, held by old laws reinforced by the National Health Service, and nourished by a respect for tradition and by a traditional respect for the care of the individual patient which still keeps the majority of doctors so concerned with the affairs of the immediate that they have little time in which to consider the future. The general practitioner remains, no longer of course able to practice the medicine and surgery of organic disease in which he has been trained, but a family doctor still. Unsure of his purpose he waits, holding the structure of a personal doctor service in existence, until a new function evolves or is assigned to him: a function for which he hopes his successors will be adequately prepared. The existence of this structure seems an asset of immense importance to one who, like myself, cannot conceive of an efficient pattern of medical care which does not include the family doctor.

It seems probable to me that the standard of medical care in most countries is primarily dependent on the standard of service given by the family doctor. Efficient hospital and specialist care can never fully or economically compensate for any major inadequacy in him. I further believe that, despite the prestige enjoyed by the specialist in the eyes of the public in the recent past, the status of the profession stands or falls by the respect and trust which the layman can place in his family doctor. The importance of the specialist has been diminished by his repeated subdivision, and he bids fair to being regarded as a kind of technician—competent always and frequently glamorous, but valuable only to some portions of some of the people some of the time.

We are fortunate in Britain to retain the structure of the old general practi-

titioner system, because within it the family doctor of the future should be easily able to develop.

In medical education, however, we are not now so fortunate. Tied by custom and by law to hospital practice, and dependent for the success of its apprenticeship system on the solar energy of general medicine and surgery, British medical education has been buffeted by repeated explosions. In each of these some fragment of medicine has broken away from the central sun to form a specialist star. The student, his feet beginning to leave the firm ground of practical medicine, floats in a galaxy of such stars. Hitching his wagon to one after another, he attempts to gather piecemeal that rich harvest of practical instruction which by tradition he seeks, and which some think may be more effectively given to him by the stars in their separate courses, than by the sun in its central wisdom.

You may find that purple patch more full of emotion than reason, but you must realise that British teaching hospitals are, because of their unusual pattern of staff organization, much more subdivided into autonomous specialised units than are yours in America. The great majority of our clinical teachers are part-time men, and most of them now follow one specialty far more exclusively than do your whole-time or part-time staff. General surgeons have almost disappeared from our teaching hospitals, and the number of general physicians (or consulting internists) is rapidly declining. Although an argument can be made for their retention on grounds of medical care as well as education, and although I myself earn my living as a part-time consulting internist in a teaching hospital, I am at this moment only drawing attention to effects on a system of training of the numerical decline of the teacher on whom that system was based.

It is, I think, undeniable that the ap-

prenticeship method of training has been weakened by the effects of specialisation on our pattern of hospital staffing. Yet I believe that we still place so great an emphasis on clinical method that our students can obtain a training in basic clinical technique which, though less good than it was, is possibly still not surpassed elsewhere.

However, the sound education in science, so eloquently advocated by Richard Davies, is still obtainable only by those who go to Oxford or Cambridge, and by a limited number of others. For the majority of our students, education (in the sense of learning how to learn) is still sadly lacking, their scientific curiosity is little aroused, and their critical faculty remains poorly developed. This is true, I believe, despite the replacement of practising physicians and surgeons by full-time scientists in our basic science departments.

Such a situation would sadden Dr. Davies could he see it; but it must alarm us. He advocated scientific education so that knowledge could more easily be advanced. We need scientific education for our future doctors, so that rapidly increasing scientific knowledge can be applied with safety. At the same time, we have to remember that this safety also depends upon the doctor's possession of sound clinical method which he can obtain only by practical training. Neither education alone nor practice alone can complete the physician. I am convinced that the family doctor of the future will have to be a scientifically minded doctor, able critically to assess new knowledge—and therefore he will have to be both educated and trained. I do not believe that he can be prepared in the future, as in the past, by a vocational training alone. On the other hand, although I hold that all specialists should be given a general medical education and training, I believe it is true, in many fields at least,

that the preparation of these thereafter could be and probably should be predominantly vocational.

I think it is true that the best American schools offer a better scientific education than can be obtained in Britain by our average medical students, but our best schools offer a better clinical training than can be obtained in the United States.

You have been able to focus successfully upon education mainly, it seems to me, because your universities have more control than do ours over the whole medical education up to graduation. This is partly because your universities employ a large number of full-time clinical staff, whereas in ours, although the number is increasing, it is still very small, and in a few schools, for example, there is not yet even a professor of medicine. Also, your pattern of hospital staffing tends to make the coordination of teaching relatively easy, while at the same time encouraging clinicians to maintain a scientific attitude of mind by enabling them to engage in original work. You seem able to rely upon a wealth of geographically full-time men who can give their undivided attention to students when required to do so.

By contrast, our pattern of hospital staffing results in a very small and predominantly part-time clinical faculty, each member of which is continuously holding independent responsibility for patients in the teaching hospital, and usually in others also. Relatively few faculty members have time or facilities for research, and the majority must teach and carry out their clinical duties at one and the same time. This is a most satisfactory system for the careful training of students in clinical technique. It is well suited to enhance the responsibility of the individual clinician toward the patients in his unit and for the students who are attached to it. It provides ex-

cellent opportunities for the apprenticeship method of training, provided that the apprentices are later going to practice that branch of medicine of which their teacher is a master.

In brief, it is a system which served very well in the days when the preparation for medicine rightly consisted of seeing what was done in a hospital, all that was being done, and only what was being done. Now, however, owing to the speed with which new knowledge is acquired, it is impossible to prepare students for the safe practice of the medicine of tomorrow merely by showing them the medicine of today. Therefore, no matter what pattern of hospital practice may now evolve, however suitable it may be to modern medicine, the preparation of doctors can never again be effective if it is wholly dependent on it and no more than a by-product of it. The scientific education advised by Richard Davies is now essential, above all for the personal doctor, together with a sound training in clinical method. Our present hospital organisation was not devised to subserve education, and we have to change to one which can effectively do so.

We cannot evade this issue merely by sending our students out from hospital into the practice of medicine in the field—for this will not provide education but only another form of vocational training in a different sphere of professional practice.

You who have been so much more successful in offering education in medicine may now feel called upon to provide better facilities for basic training for graduates and postgraduates, and it may be that this can be done only by some alteration in your pattern of hospital practice. At first sight the temptation to evade the issue by sending your students outside the hospital for vocational training may be greater for you than for us—but I do not believe that

basic training in clinical method can ever effectively be provided outside a teaching hospital.

In Britain in 1957 our General Medical Council placed the full responsibility for medical education upon the universities, thus ending what had been, in effect, a 99-year lease of education to hospital practice. This responsibility does not, of course, give the universities the power to change the pattern of that practice, but the teaching hospitals of Britain have been given autonomy in the National Health Service, each under a separate Board of Governors, which is charged with the duty of providing the needs of the medical school. Naturally these Boards, the descendants of those who created and maintained these old hospitals for the care of the sick, are only partially aware that they will be judged by posterity less by the treatment given to patients today than by the efficiency of today's students in 20 years' time. However, the mechanism exists for effecting those changes which will result in our teaching hospitals' being able to provide all that which is needed for a university education, as well as for a practical training in medicine; nor is there even the slightest chance that by their doing so any patient will suffer, since one of the requirements of education and training is that the student shall see the highest standard of medical care given to each individual patient, and this entails the existence of highly specialised departments.

Another of the requirements of education is that the student will be able to observe and study patients outside a hospital, so it is inevitable that the teaching hospital will have to engage in, or be firmly linked with, the full facilities for providing total medical care in at least a small community.

A third requirement of education is that the teaching hospital shall be en-

gaged in the advancement of knowledge, and of diagnosis, treatment, and prevention of disease. This means that in it there must be cared for specially selected patients who will not necessarily belong to the community which it serves.

It follows that great care will have to be given to ensure that the Teaching Hospital does not take on a greater amount of work, either total or in any one direction, than that which is possible for the proper fulfillment of its objectives. It follows also that the demand which it creates for special or general medical care should always exceed that which it can supply, for if it does not do so, it will be failing to set the highest and newest standards.

Much, then, has to be decided and can be decided only by experiment, as to the quantity and nature of medical service which the teaching hospital must and must not undertake. It is only by experiment, also, that the most suitable pattern of staffing for it can be decided—but it is safe to assume that this pattern will be very different from that required by nonteaching hospitals.

It is clear, therefore, that universities must study the problems of medical care assiduously before they can fulfill their responsibilities for medical education. This necessitates a very different attitude by the university toward the medical school than that of regarding it as an expensive appendage which is mainly concerned with technical training. Fortunately, however, the medical school now has so much to offer a university that the latter could not effectively engage in the science of man without it. What is more, the universities are now possessed of those departments which make the study of medical care possible, and for this reason can be expected to concern themselves with those problems in it which extend far beyond the ones set by the requirements of education.

In both our countries the help of the universities in planning medical care is, I believe, urgently needed. The direction in which medicine moves at any one time is the resultant of but few forces: one is its power (what it has to offer, its knowledge and skill), a second is the challenge made to it (what the prevailing incidence of disease calls upon it to do), and the last is composed of the socio-economic conditions of the country at the time. In the past medical skill and the incidence of disease alone have largely determined the direction of medicine—but now the cost of medical care is such that economic considerations have become the dominant force. The only alternative to evolution dictated by financial expediency is to discover as precisely as possible what is most needed and by what pattern of practice it can most efficiently be given, so that the profession may then give the best that the country can afford.

It will be interesting to see, when on each side of the Atlantic medical education has become better adapted to medicine, how much we have each incorporated of the other's present arrangements. How much, I wonder, of the complete personal independence I and my clinical colleagues in the Teaching Hospitals of Britain now enjoy, will we have surrendered to the service of our universities—and thus approximated to your pattern of hospital practice? To what extent will you in the United States have swung back to our pattern of a family doctor, practicing outside the hospital, coordinating both medical and socio-medical care? How much will we both have come to realise that our professional happiness depends upon what we offer to the public rather than what we may receive from it? In both countries, however, when the student has acquired a scientific method of thought, together with facility in clinical method, and has these so balanced one with the

other that he is able to profit from experience, he will need (whether he aims to become a family doctor or a specialist) a period of postgraduate training in which to grow in both judgment and knowledge. This postgraduate period will then be the "finishing school" which Richard Davies described, and presumably it will be mainly vocational and will vary in content with the needs and aspirations of the individual. It is to be hoped that, faced with this extension of the time needed to prepare for medicine, we do not again make the mistake of trying to shorten the total by reducing those years which are needed for education. There seems no reason why scientific education and basic training should take any longer time in the future than it does now (provided, of course, that education and not memorisation of the total content of medical knowledge is the aim), but it cannot be expected to require less. At the end of it the technical complexities of every branch of medicine necessitate several years of postgraduate training; but these are years of apprenticeship and should be so financed. In Britain the National Health Service largely solved this financial problem—solved it so suddenly, in fact, that before the profession had prepared plans for postgraduate training and effective methods of selection, more young doctors than ever before had embarked upon it. Of these some were unsuitable for the paths they had chosen, and others were paid to receive unprofitable training, while in any case the total number was in excess of the posts which could become available. The result has been that many men, after some years of preparation for hospital work, have not been incorporated into the hospital service. This is an example of inadequate planning of postgraduate training, but it also shows how the financial difficulties can almost too easily be overcome.

The primary purpose of this post-graduate period is to obtain a vocational and technical training in a particular branch of medicine, and the most appropriate means of achieving it seems to me to be that of practice under close supervision—apprenticeship, in fact. The difficulty lies in defining how much practice and how much supervision are required, and there is always the danger that too much responsibility will mean that the trainee is regarded merely as a pair of hands. If this happens, he has little chance to fulfill the secondary purpose of the period, which must surely be to make up for whatever deficiencies may remain to him from his undergraduate (or, as you would say, graduate) education. In times of transition these may be great, and in any case they should vary with the individual. While they must be made good so far as is possible, it is obviously unrealistic (unless improvement in graduate education is despised of) to plan postgraduate training in general so as to give priority to objectives which should have been achieved before it is begun.

For this reason it seems to me that research should not be forced upon all postgraduates. I am sure that the better educated the modern doctor has been, the more he will wish to engage in original work (and this fact poses problems for us in Britain, because hitherto our pattern of practice has allowed time and facilities for research to very few). On the other hand, it would be surely wrong to demand, either for educational or financial reasons, that a man spend time on research if he is unlikely to learn from it or enjoy it. His results in any case would be more than likely to swell that conglomeration of not very useful publications, from which the sifting of real contributions requires an ever increasingly high standard of discrimination and more time than is available. Yet there

seems everywhere to be some mystic significance attached to research which makes it required of a postgraduate before he can become medically decent. I accept that everyone should be scientifically critical and that research may help many to be so. I agree that for those whose research fails to advance knowledge, it may have been better as it were to have loved and lost than never to have loved at all—but it seems a pity to have to do it if it hurts, and if it interferes with other aspects of training which are also very important. This does not, however, alter my conviction that Richard Davies was correct in his advocacy of investigation as a powerful tool of education in the graduate period.

He was right, too, I think, in one other matter. He has given a good example of the only procedure by which we should tackle reform of medical education. This procedure may be defined as thought, word, and deed. Doctors unfortunately are very inclined to be doers rather than thinkers, and one frequently hears the view expressed that it is time we stopped talking about medical education and did something. This is a natural but rather dangerous attitude, and possibly indicates a scarcity of clear thinking. Thought is the primary requirement, for it alone can lead to correct action, and indeed it alone can ensure that the information on which action must be based is acquired, if necessary by techniques which are new and frightening to the doctor, without the painful acquisition of irrelevant and confusing data. Words, of course, are the only means in this context of translating thought into action, provided they are spoken in the right quarter at the right time. Abraham Flexner showed this, but before his time Dr. Richard Davies had successfully exerted all his influence by an Epistle (in which all that I have quoted is to be

found) to the Rev. Dr. Stephen Hales, who was not only an illustrious research worker but also happened to hold the very influential office of the Clerk to the Closet of Her Royal Highness the Princess of Wales.

Words, of course, are also the invaluable instigators of thought, and therefore conferences on medical education can be of use. The meetings of this Association and the Institute which it holds are the most profitable sources of stimulus that I have yet found. This is the 4th annual

meeting and will be the third Institute which it has been my privilege to attend. I am deeply grateful to you for the honour of being invited a second time to address you, an honour which is more deserved by the status of medicine in my country than by myself. I cannot thank you enough for the opportunity to return once again to find stimulation, knowledge, and wisdom among friends who have given so much more thought than I to the problems of medical education, in which after all I am but an amateur.

The Relationship between Initial and Retest Scores on the Medical College Admission Test

CHARLES F. SCHUMACHER, PH.D.,* and HELEN HOFER GEE, PH.D.†
Association of American Medical Colleges, Evanston, Illinois

INTRODUCTION

One of the many problems facing the medical school admissions committee is the task of interpreting the Medical College Admission Test scores of applicants who have taken this examination more than once. Each year between 500 and 600 of the students competing for places in the freshman classes of U.S. medical schools have taken the MCAT at least twice, and possibly three or four times. Even though this group constitutes only about 4 per cent of the total applicant pool, the number of people involved is large enough and the importance of the MCAT as a selection device is great enough to warrant study of retest effects.

In attempting to investigate this problem, one of the first questions to be considered is that of differential effects for groups that are widely separated in terms of scholastic ability. It is not unlikely that high and low ability students perform differently upon retesting, and such differential effects, if they exist and if they are not simply the result of chance factors, would be important information for the test user to have at his disposal in attempting to evaluate a given applicant.

METHOD

Subjects for this study were 2867 medical school applicants who took the MCAT more than once between October, 1954, and October, 1957. Of these students,

* Assistant Director of Research, Association of American Medical Colleges.

† Director of Research, Association of American Medical Colleges.

2687 took the test twice, 164 took it three times, and sixteen took four administrations. For the present study, only the first and second administrations were considered.

To investigate retest effects at various ability levels, three groups of students were selected from the total sample on the basis of their initial Verbal Ability (VA) and Quantitative Ability (QA) scores. Students whose initial VA and QA scores were 500 or above were classified as "high ability," those whose VA and QA scores were between 400 and 499 were classified as "middle ability," and those having both VA and QA scores below 400 were classified as "low ability."¹ The number of students in each group was as follows: high—298, middle—587, low—527.

Separate analyses were performed for each of these ability-level groups and for the entire sample, which included 1,455 additional students who could not be classified into any of the three ability groups because of discrepancies between VA and QA scores.

For each group the proportion of students whose retest scores increased, decreased, or remained the same was tabulated. Average scores obtained on the first and second administrations were computed, and the differences between these means were tested for significance.

¹ The minimum score in the "high ability" group was about equal to the mean score obtained by all students taking the MCAT in a given year, and the maximum score in the "low ability" group was approximately 1 standard deviation below this general mean.

Since these means were based on the same individuals at two points in time, the correlated *t* statistic was used to test for significance of differences.

RESULTS AND DISCUSSION

About 65 per cent of the total sample raised their VA scores upon retesting, 8 per cent showed no change, and 27 per cent obtained lower scores. For the QA subtest the proportions were: higher, 62 per cent; no change, 6 per cent; lower, 32 per cent. On the Modern Society (MS) section about 59 per cent obtained higher scores, 7 per cent remained the same, and 34 per cent showed a decrease. Almost three-fourths of the group (73 per cent) showed an increase on the Science Achievement (SA) section, 5 per cent were unchanged, and 22 per cent obtained lower scores.

Differential effects for groups at different ability levels were also noted. On VA and QA, gains were made by a larger

proportion of students in the low ability group than in the middle or high ability groups. However, on the SA section almost eight out of ten (78 per cent) high ability students showed an increase, while only about 68 per cent of the low ability group gained upon retesting. No significant differential effects were observed for the MS subtest.

Table 1 shows the average score on each section of the MCAT made by each group on each administration, the corresponding standard deviations, and the differences between the first- and second-administration averages. This table also contains the results of the tests of significance that were performed to determine whether or not the observed differences between the first- and second-administration averages could reasonably have occurred by chance alone.

With one exception, statistically and practically significant increases in scores occurred on each section of the test at

TABLE 1
MEANS, STANDARD DEVIATIONS, AND *t* TESTS FOR FIRST AND SECOND MCAT
ADMINISTRATIONS ACCORDING TO ABILITY LEVEL OF STUDENTS

ABILITY LEVEL	N	ADMIN. 1		ADMIN. 2		DIFFERENCE (2-1)	<i>t</i>
		Mean	S.D.	Mean	S.D.		
Verbal Ability							
High	298	572	53.2	586	65.1	14	5.45*
Middle	587	451	28.4	470	51.6	19	10.57*
Low	527	346	35.1	376	56.2	30	14.57*
Total group	2867	440	84.7	462	88.4	22	25.79*
Quantitative Ability							
High	298	572	48.5	573	62.6	1	.32
Middle	587	450	28.6	475	62.6	25	10.17*
Low	527	337	41.2	375	64.9	38	14.91*
Total group	2867	440	87.8	464	90.7	24	20.43*
Modern Society							
High	298	549	78.9	564	75.6	15	4.29*
Middle	587	457	63.1	476	64.9	19	7.91*
Low	527	384	59.2	400	63.6	16	6.20*
Total group	2867	452	83.1	469	83.9	17	16.12*
Science Achievement							
High	298	492	83.9	545	82.4	53	15.28*
Middle	587	421	62.5	462	69.6	41	17.64*
Low	527	352	55.6	384	66.4	32	12.41*
Total group	2867	413	76.9	455	85.3	42	37.22*

* *t* significant at 0.1 level.

each level of ability. The one exception was the QA scores for the high ability group, where the observed difference could have been the result of chance factors. All other differences were significant at the .01 level.

The sample considered as a whole gained an average of 20-25 points on VA, QA, and MS, and an average of about 40 points on SA. Rates of change on the various sections of the test differed, however, for groups at different ability levels. The group whose initial VA and QA scores were relatively high (500 or above) gained an average of about 15 points on VA and MS, showed no significant change on QA, and gained an average of about 50 points on SA. On the average, the middle ability group gained more (20-25 points) on VA, QA, and MS, but less on SA than their high ability peers (about 40 points). The lowest group (initial VA and QA scores below 400) gained 30-40 points on VA, QA, and SA, and about 15 points on MS. Thus, on VA and QA the low ability group made the largest gains, whereas the high ability group gained the least. However, the pattern is reversed on the SA section.

Because students were assigned to ability-level groups on the basis of their initial VA and QA scores, it is hardly surprising that the low ability group gained more than the high ability group on these two subtests. No matter what these subtests measured, the results that were obtained would be expected simply through the operation of chance factors, or more precisely, through the operation of the phenomenon known as regression toward the mean. However, the differential gains made by these groups on the SA section, which is primarily a measure of achievement in the premedical science areas of biology, chemistry, and physics, support the hypothesis that the VA and QA sections are measures of the student's

scholastic potential. It would be reasonable to expect students with high scholastic aptitude to learn faster and profit more from additional experience than students at lower ability levels, and thus to make greater gains on an achievement examination. In other words, if VA and QA were not measures of scholastic potential, it would be difficult to explain the results that were obtained on the SA section. In fact, if one assumed that VA and QA scores were unrelated to scholastic ability, one would predict no significant differences between these groups in terms of gain scores on the SA section.

On the MS section all groups gained approximately the same amount upon retesting. This subtest, however, is not primarily an achievement measure, and no differential gains would be predicted for groups at different ability levels.

While the above considerations are important in understanding the psychometric properties of the MCAT, the more important question from the point of view of the test user concerns the implications of these findings for the problem of deciding upon the best estimate of the individual's "true" ability in each of the areas measured by this test. On purely statistical grounds, the best estimate would be derived from averaging the scores obtained on the two administrations. However, there are also several important psychological factors to be considered, some of which militate against using a simple average to estimate the student's "true" ability.

First, any test can sample only a portion of the student's knowledge or skill in a given area. In the selection of questions to be used to measure this area it is possible that, by chance, the first test may sample material that is more (or less) familiar to a particular student than the material used in the second test. When the difference between the two test scores reflects only chance selection of

items, a simple averaging of the two scores provides a reasonable estimate of the student's ability.

A second factor to be considered is the extent to which the experience of taking the first test in and of itself facilitates the student's performance on the second. Familiarity with directions, format, item types, etc., may increase the test-takers' efficiency in approaching the testing situation and result in a higher score being made on subsequent tests. On the assumption that one wished to eliminate this source of variation between the two test scores, a simple averaging would not yield the best estimate; use of the initial score would be more appropriate.

The conditions under which the test is taken can also have a marked influence upon the scores that are obtained. It is now generally agreed that scores on tests of maximum performance such as the MCAT are relatively unaffected by minor physiological disturbances or physical discomfort of the student. However, some individuals attempt the MCAT under extremely unfavorable physiological conditions, and some are subject to extremes of anxiety in the test-taking situation. Both of these conditions generally tend to inhibit, rather than to facilitate test performance, again making a simple averaging of scores inappropriate.

Finally, and perhaps most important, is the fact that new learning may take place between the two testings. This is a particularly important consideration for achievement tests such as the SA section of the MCAT. Because many students first attempt the MCAT before they have taken basic courses in all three of the premedical science areas—biology, chemistry, and physics—it is quite possible that in many cases new knowledge has been acquired between the first and second testings. In this case the second score

would provide the better estimate of the student's "true" level of attainment. An intensive review of science course materials could also result in significant improvement on retesting, and again the second score would provide the more appropriate estimate.

From the data available in the present study it is not possible to determine the extent to which each of these factors has operated to produce the results that were obtained. It is clearly inappropriate, therefore, to attempt to formulate any "general correction factor" to be applied to all retest scores or to recommend that either the initial or the retest score be used in all cases.

Assuming that testing conditions were constant for both administrations and that gains from test-taking experience were negligible, one might attempt to cancel out the effects of item sampling on the VA and QA sections of the test by using an average of the two scores. Under the same assumptions, plus the knowledge that no additional work had been taken in undergraduate science areas between testings, one would probably use an average of the two SA scores. On the other hand, if additional premedical science work had been taken after the first testing one would probably select the retest score as the better estimate of the student's knowledge in this area.

CONCLUSIONS

On the basis of the results obtained in this study the following tentative conclusions are drawn:

1. Individuals with initial VA and QA scores at 500 or above may be expected to gain an average of 15 points on VA and MS upon retesting. This group may be expected to raise its average SA score by about 50 points, but no gain should be expected in average QA score.
2. Individuals with initial VA and QA scores between 400 and 499 may be ex-

pected to gain an average of 20-25 points on VA, QA, and MS. An average retest gain of about 40 points may be expected on SA.

3. Individuals whose initial VA and QA scores fall below 400 may be expected to gain an average of 30-40 points on VA, QA, and SA, and an average of about 15 points on MS upon retesting.

4. In general, average MCAT scores increase upon retesting. Over-all increases of 20-25 points in average scores may be expected on the VA, QA, and MS sections, and an average increase of about 40 points may be expected on the SA section.

5. Low ability students gain more on VA and QA than students at middle or high ability levels, but students at high

ability levels gain more than middle or low ability students on the SA section. This tends to confirm the hypothesis that the VA and QA sections of the test are measures of scholastic potential.

6. From this study it is impossible to formulate a "general correction factor" to be applied when scores from more than one MCAT administration are available. Averaging the VA, QA, and MS scores appears to be appropriate in most cases, and the use of the retest score is usually appropriate for the SA section. However, depending upon the specific conditions under which the test was taken and the experiences which the student has had between testings, one might legitimately use either the initial or the retest score for a given applicant.

Supply and Demand for Faculty in Anatomy

EARL ELDRED, M.D., AND BERG ELDRED

Department of Anatomy, School of Medicine, University of California
at Los Angeles, Los Angeles, California

Medical education is in a dilemma. It must advocate the immediate development of new schools at a time when schools now in existence are unable to fill vacancies on their faculties. The stress of this situation is particularly felt in the large and pivotal teaching field of anatomy, where there already exists a chronic insufficiency of personnel and teaching positions (15, 42, 43). Six years ago eighteen budgeted, full-time faculty positions on rosters of anatomy departments in American medical schools were unfilled (Table 1). During the 1958-59 academic year 55 vacancies were reported, an increase of 200 per cent (31). Over the same period the number of students receiving doctoral degrees in anatomy declined by 25 per cent (Chart 1). Thus, the gap between supply and demand for faculty in this basic discipline is widening at a time when medical education must enter into a period of unprecedented expansion.

Anatomy is not alone suffering from shortage of manpower. Needs for teachers at the college level will rise sharply over the next decade as the population of college age swells in absolute and relative numbers, and the percentage of this age group seeking a higher education increases (19). This special need to provide educational opportunity for a disproportionate population bulge is being projected against a background of increasing relative demand for persons of

college training. From 1957 to 1970 there will be a 60 per cent increase in employment of technological and scientific personnel, among whom professional workers will be by far the fastest growing group (7). Other occupational fields, such as administration and sales, at the same time will be looking more and more to college-trained people (7). In response to these demands, the number of degrees conferred at graduate levels is increasing at a much more rapid rate than the total number of degrees conferred annually at all levels (21). It is not surprising that scarcities have appeared within that top bracket of the population capable of graduate work. The study of medicine, for example, last year attracted fewer applicants per opening in the freshman class than in any year since 1948-49 (31).

The development of these general shortages for talent coupled with the already existing insufficiency of supply makes it a matter of pressing concern for the profession of anatomy to gain insight into the factors influencing the supply and demand for anatomists. This paper attempts to make an appraisal of some of these factors.

NUMBERS AND EMPLOYMENT OF ANATOMISTS

The great majority of American anatomists are employed by academic institutions. These include the basic science divisions of four preclinical schools, 81 4-year medical schools, four postgraduate medical colleges, six schools of osteo-

*Associate Professor, Department of Anatomy.

TABLE 1

UNFILLED, BUDGETED, FULL-TIME FACULTY POSITIONS IN DEPARTMENTS OF ANATOMY OF MEDICAL SCHOOLS IN THE UNITED STATES (29-31, 43)

Academic year:

Vacancies	45-46	50-51	51-52	52-53	53-54	54-55	55-56	56-57	57-58	58-59
	23	40	36	21	18	25	18	22	45	55*

* Eighteen of the vacancies in 1958-59 were at the level of associate or full professor.

pathy, and 47 schools of dentistry in the United States and Puerto Rico, and the twelve medical schools and six dental colleges of Canada (4, 31, 34). An occasional university not in these classifications has a professorship of anatomy (3). Faculty in schools of veterinary medicine are not considered here for the somewhat arbitrary reason that very few teachers in these schools hold a Ph.D. degree in anatomy (22).

Government agencies, according to a 1951 national survey of scientific personnel, employed 11 per cent of all "anatomists" (39), but some of the individuals included in this survey probably had only the baccalaureate degree in anatomy. The 1959 roster of the American Association of Anatomists, which is essentially restricted to scientists with advanced degrees, listed 128 individuals or 10 per cent of the total membership as employed in nonteaching positions in government agencies or universities (3). In 1949, only 73 individuals or 8 per cent of the membership were so employed (2), so that nonteaching employment is probably increasing. Only an occasional individual is an employee of an industrial laboratory.

There were 706 full-time budgeted positions in ranks from instructor to professor in anatomy departments of American medical schools in 1958-59, and 76 in Canadian schools (31). The authors estimate that an additional 100 anatomists are employed in independent anatomical divisions in schools of osteopathy, dentistry, and the paramedical sciences.

The total number of career anatomists, including those in research positions, is thus between 900 and 1000.

Assuming that the average anatomist is active in teaching for 40 years and that the population of anatomists is a static one with equal numbers of individuals at each age, it is evident that nearly 25 individuals would go into retirement each year. Actually, there is probably a disproportionate number of anatomists in the older age brackets. According to data of 1951, 29 per cent of the full professors were over 60 years of age, while, for comparison, in bacteriology only 21 per cent, physiology—23 per cent, and pharmacology—14 per cent were approaching retirement (17). This differential in ages extended to the rank of instructor, in which the median age in anatomy was 37 years, as compared with 32 in physiology, for example. With median age values used for each rank (17), it may be estimated from life expectancy tables (40) that five to six anatomists under 66 years of age die each year.

TRAINING AND SOURCES OF ANATOMISTS

Doctors of Medicine.—Twenty-eight per cent of the full-time teachers of anatomy in American medical schools in 1959 possessed the M.D. degree (31). More medical graduates taught in anatomy than in medical biochemistry, where only 12 per cent were M.D.'s, but less than in physiology, 35 per cent; or pharmacology, 44 per cent. The pattern in Canada differed sharply, since 78 per cent of individuals on anatomy faculties

had a medical degree. The ratio of M.D.'s among teachers of anatomy would be higher if part-time teachers were also included, for the use of young, practicing physicians and of postgraduates undergoing further medical training is probably more prevalent in anatomy than in any other preclinical discipline (17, 43).

The proportion of career anatomists holding the M.D. degree is less at the more junior teaching ranks. Only 17 per cent of the members of the American Association of Anatomists with appointments as assistant professor of anatomy possess an M.D. or its equivalent medical degree, as compared with 30, 38, and 52 per cent for the associate, full, and emeritus professors, respectively (3). Over the last 10 years, the percentage of M.D.'s among all anatomists at ranks of assistant professor to full professor has decreased from 36 per cent to 30 per cent

(2, 3). The proportion of chairmen having medical training declined from 70 per cent in 1939 (43), to 48 per cent in 1955 (42), to approximately 40 per cent in 1959 (3). It is evident that guidance of the profession of anatomy is passing from the hands of medically trained men.

Fewer graduates of American medical schools become career anatomists than is indicated by the numbers having M.D. degrees, for the latter include teachers with foreign training, virtually all of whom have medical degrees. In 1955, individuals who had received their highest earned degree at a university outside the United States and Canada comprised 8 per cent of the anatomists at ranks of assistant professor to full professor (42). This ratio exceeded the percentage of foreign-born in the general population, 6.9 per cent (40), or among biological scientists, 4.6 per cent (24).

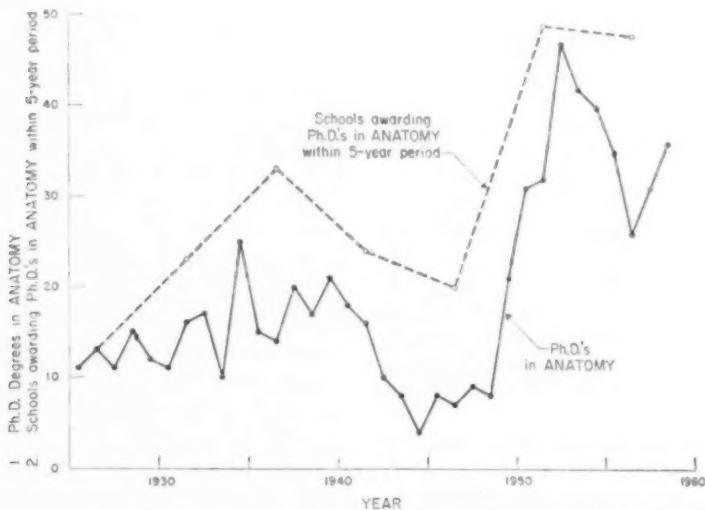


Chart 1.—Number of Ph.D. degrees in anatomy granted by American and Canadian Universities over the last 34 (solid line) years, and numbers of universities awarding a Ph.D. degree within 5-year periods (broken line) (11, 20, 25). The source for data of 1956-57 contains six names included also in 1955-56. These have been included only in the 1955-56 total.

Doctors of Philosophy.—In 1959, 67 per cent of full-time teachers of anatomy in American medical schools had the Ph.D. degree alone, and 6 per cent had earned both the M.D. and Ph.D. degrees (31). Anatomy was early recognized as a field of graduate study in American universities, and during the decade of 1898-1907, nine doctoral degrees were awarded in this field (8). The average number of theses accepted each year then steadily increased: 2.1 per year up to World War I, 2.8 during that war, and 5.4 over the years 1920-24 (8, 39). By the year 1939-40, the number of graduations in the field of anatomy had increased to 16 (Chart 1). The second World War had a disastrous effect on enrollments in all fields of graduate study (Chart 2), and in anatomy only 54 degrees were granted over a 7-year period. Several years after the end of the war, a surge of students completed graduate studies, and in the year

1952, 47 degrees in anatomy were granted. The number then dropped sharply, and in 1957-58 there were fewer than 30. The output of Ph.D.'s in anatomy may again be increasing, since the number of graduates last year was greater than in the previous year, and the predoctoral enrollment was 13 per cent higher (Table 2). However, the positions available for students pursuing graduate studies in anatomy still exceed the number of enrollees by 57 per cent (31).

The particular seriousness of the decline in numbers of graduates over the last dozen years is recognized if Ph.D. productivity in anatomy is compared with that in kindred fields—physiology, zoology, and all natural sciences (Chart 2). Physiology, it should be noted, is not as closely restricted to medical school teaching as is anatomy, for in the last 2 years only 35 per cent of the doctoral

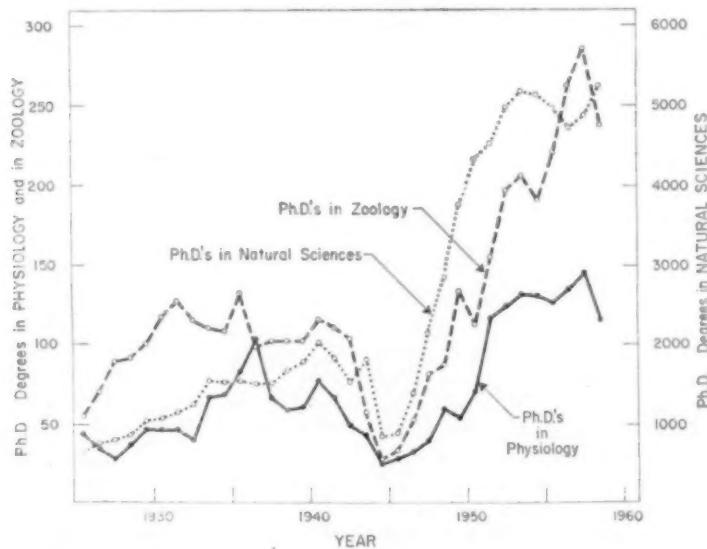


Chart 2.—Curves showing numbers of doctoral degrees granted annually in all natural sciences (dotted line), zoology (broken line), and physiology (solid line) (20, 25, 39).

TABLE 2

ENROLLMENTS IN PH.D. PROGRAMS IN ANATOMY AT MEDICAL SCHOOLS
IN THE UNITED STATES*

Year	No. Ph.D. students enrolled (29-31)	Schools having enrollment
1956-57†	159	41
1957-58	159	48
1958-59	180	49

* Canadian schools had seven enrollees in four institutions in 1957-58, and five students in 1958-59. About 65 American schools offer a Ph.D. program.

† Data for year 1955 have been omitted as they are incomplete (28).

degrees in physiology were earned in medical school departments. As in anatomy, the numbers of doctoral graduations in these allied subject fields rose swiftly several years after the war. Graduations in anatomy, however, reached a peak in 1952-53 and then declined strongly, whereas those in the other fields continued to rise until 1957, when both zoology and physiology graduated more Ph.D.'s than ever before. It is evident that lack of graduate students in anatomy cannot be blamed entirely on scarcity of young people of suitable quality and general intellectual interests, but has been due in part to a failure of anatomy to compete successfully in the attraction of candidates.

Eighty-seven universities, medical and nonmedical, have granted Ph.D. degrees in anatomy over the past 34 years (11, 20, 25). The numbers of schools which have actually granted degrees, within 5-year periods are plotted in Chart 1. Numbers of Ph.D. programs offered would be somewhat higher. In the last 5 years, for example, only 49 schools had functioning programs (20), although more than 60 departments of anatomy stated that they offered a Ph.D. program (42). Eleven schools apparently have initiated graduate programs within the last 5 years, since no records of earlier graduations were found. Excluding these new programs, 31 American and Canadian universities granted only one to four

Ph.D. degrees in anatomy over the last 34 years. On the other hand, ten universities have each awarded twenty or more doctoral degrees, and three are credited with over 50 (Table 3). These three schools, the Universities of Minnesota, Michigan, and Chicago, have graduated 28 per cent of all Ph.D.'s in anatomy over the last 34 years. The University of Michigan has been among the top schools in terms of graduates in every 5-year period, and Minnesota and Chicago have been leaders in most of these periods (Table 4). New names among the leaders may appear in the next few years, however, for the Universities of California at Los Angeles, Kansas, and California at San Francisco have the highest current enrollments (31). The traditional leaders in terms of number of teachers in medicine, Johns Hopkins and Harvard Universities (10), are each listed as having only three Ph.D. graduates in anatomy over the last 34 years. However, in 1955, at least 22 positions in anatomy at ranks of assistant professor or higher were held by Harvard men, and eleven were from Hopkins (42). Yale was credited with 30 anatomy teachers, but has graduated only sixteen Ph.D. students in anatomy in over 30 years. Apparently these schools have contributed to the rolls in anatomy through their medical, rather than their graduate programs.

It cannot be assumed that all the 36 Ph.D.'s in anatomy graduated last year

TABLE 3

RELATIVE RANKING OF AMERICAN AND CANADIAN MEDICAL SCHOOLS IN RESPECT TO PRODUCTIVITY OF PH.D. GRADUATES AND TEACHERS IN ANATOMY

Ph.D. degrees in anatomy granted, 1924-1959*	Highest Ph.D. enrollment in last 3 years†	Highest earned degree of assistant, associate, and full professors in anatomy‡	
Minnesota	59	California at L.A.	Chicago 36
Michigan	57	Kansas	Yale 30
Chicago	57	California at S.F.	Cornell 28
Washington U.	33	Columbia	Michigan 26
Cornell	32	Chicago	Harvard 22
Columbia	26	Ohio	Minnesota 18
McGill	26	Minnesota	Iowa 17
New York	23	Duke	New York 16
Northwestern	23	Michigan	Columbia 14
Kansas	20	Illinois	Wisconsin 13
			Northwestern 13

* Sources: (11, 20, 25).

† Based on relative ranks held during each of last 3 years. Sources: (29-31).

‡ In 1956. Source: (42).

entered the profession of anatomy. Two-thirds of anatomy departments with graduate programs have reported that some of their students transferred to medical school after receiving the Ph.D. degree, and twelve stated that half or more of their graduates had done so (42). Certain schools sponsor coordinate programs permitting the student to earn both the Ph.D. and M.D. degrees in the course of postgraduate medical training or by extending the period of predoctoral study (32). Few of these individuals are eventually attracted to the profession, since the proportion of assistant professors of anatomy possessing both Ph.D. and M.D. degrees is only 5 per cent (3, 42). Considerable numbers of foreign trainees who return to their homelands after graduation must also be subtracted from the total number of graduates. The extent of this total loss is indicated by the fact that, of 157 males who graduated in the years 1951 to 1956 only 41 per cent were listed as having positions in anatomy in the 1959 roster of the American Association of Anatomists. Presumably in the intervening years most graduates who had become professional anatomists

would have joined the Association, for it is the sole American organization devoted to the scientific, teaching, and professional interests in the field of anatomy.

The proportion of all Ph.D. graduates in anatomy who enter the profession is even smaller than 41 per cent, for the loss of women Ph.D. graduates to the profession is probably disproportionate. During the last 6 years, one-fifth of the doctoral awards were made to women (2). Yet, according to the 1959 roster of the American Association of Anatomists, only 7.3 per cent of members having academic positions were women (3). This is, however, an increase from 10 years earlier, when 5.3 per cent were women (2). The absence of long-term change in the ratio of women among medical graduates (about 5 per cent) (35) and in the percentage of women who annually earn Ph.D. degrees in all fields of science (12) suggests that this increase in the proportion of women in the profession of anatomy is exceptional. It may be noted also that the ratio of women among graduates in anatomy is twice that found among Ph.D. graduates in all fields of science (12).

TABLE 4

AMERICAN AND CANADIAN UNIVERSITIES RANKED ACCORDING TO NUMBERS OF
PH.D. DEGREES IN ANATOMY AWARDED WITHIN CERTAIN PERIODS

Rank	1929-39*	Degrees	1939-49	Degrees	1949-54	Degrees	1954-59	Degrees
1	Chicago	21	Minnesota	14	Michigan	15	Michigan	15
2	Minnesota	17	Michigan	11	Washington U.	15	Chicago	12
3	Michigan	21	Cornell	9	McGill	12	Wisconsin	10
4	Cornell	11	McGill	8	Minnesota	10	Kansas	8
5	Columbia	9	Chicago	7	Columbia	10	Minnesota	8
			New York	7				

* Note that first two columns are for 10-year periods, and last two columns are for 5-year periods.

Ph.D. graduates in other majors.—There have been approximately 700 Ph.D. graduates in anatomy over the last 40 years, but probably fewer than half of these have entered the profession. Additionally, there are today fewer than 300 anatomists with a medical degree alone. Considering that many replacements have been needed during the last 40 years and that the present population of anatomists is approaching 1000, it becomes evident that there must be another source for anatomists. Ph.D. graduates in fields other than anatomy are the source, with the major influx probably coming from the field of zoology. Data on the extent of this contribution are unfortunately not available.

The Master's degree program in anatomy.—Only rarely, and at a very junior level, is a Master of Science degree sufficient qualification for full appointment to an anatomy faculty in a medical school (31, 42). Moreover, only a half dozen of the 1,300 members of the American Association of Anatomists, an organization requiring demonstration of scientific competence for membership, have the master's degree as their highest academic award. However, in some paramedical fields, this degree serves as sufficient qualification for the teaching of anatomy.

These limitations are not reflected in the utilization of this secondary degree, for the number of students receiving a

master's degree in anatomy, except during the war period, has increased over the last 30 years (30, 31, 39). In the last 2 years, 79 M.S. degrees in anatomy were granted by medical schools in the United States and Canada (30, 31). The current enrollment of 160 students is distributed among 45 of the approximately 60 schools offering this program (31). In graduate training in anatomy it is apparently the more usual practice to attain this lesser degree in the course of working for the Ph.D., since 63 per cent of anatomy faculty members with the Ph.D. degrees have also a master's degree (3). This correlates with the observation that fluctuations in the number of M.S. degrees granted per year tend to precede by 2 years fluctuations in the number of Ph.D. degrees. There is no trend toward a change in the practice of attaining both degrees, since the proportion of anatomists having a master's degree at each academic rank is essentially the same (3). Among faculty members with the M.D. degree alone, only 19 per cent have a master's degree (3).

FACTORS INFLUENCING THE NEED
FOR ANATOMISTS

Teaching of medical students.—If the ratio of physicians to population which prevailed in 1955 is to be maintained in 1975, the annual number of graduates of United States medical schools must in-

crease from the 7,290 of 1960 to 9,460. This assumes a continuation of the influx of foreign-trained physicians at current rates (36). The training of these additional students will require an expansion of facilities equivalent to over twenty new schools with graduating classes of 90 students each (36). This burden could be eased by the creation of new 2-year schools to furnish the additional 400 students per year that existing schools might admit to their third-year classes. This course, however, may actually increase the number of departments of anatomy needed, since classes in preclinical schools tend to be less than half the size of those in the average 4-year school (31, 43).

The contrast of this needed expansion with past rates of growth in medical school facilities is striking. Prior to the end of World War II, the number of 2- and 4-year schools had remained almost

unchanged for 2 decades (Chart 3). Since then, new schools have opened at a rate of one per year, so that by the fall of 1960 thirteen more schools in the United States and Canada will be accepting freshmen than in 1947 (30). This unprecedented rate of growth must be nearly doubled over the next decade.

Some saving in terms of teacher-hours might result if the size of student classes were to increase. The over-all history of the size of first-year classes of medical schools has been one of slow increase. From 1931 to 1936, the annual mean enrollment was from 82 to 86. Afterwards, perhaps in response to improvements in selection procedures (35), the size of the average class dropped to 75 students. During World War II and again in the early post-war years, increases occurred, but over the last 8 years class size has remained at 93-96 students (31). The mean class size in eleven schools estab-

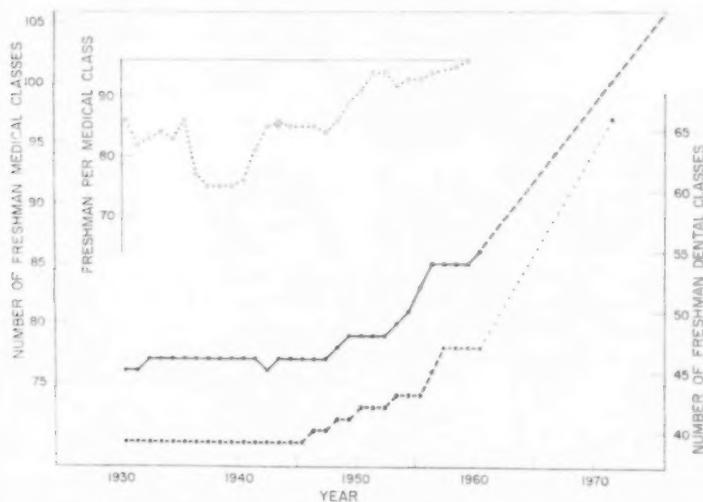


Chart 3.—Curves showing past numbers and projected needs for American medical (solid line) and dental (broken line) schools. Curve at upper left indicates mean size of classes of medical students as calculated by dividing total enrollment of freshman students by the number of 2- and 4-year American schools (16, 31, 32).

lished over the last 10 years is only 72 students. If future new schools also have small classes, the mean size of all freshman classes may even, for a time, grow smaller. No conservation of teachers can be expected.

The need for teachers is, of course, related to the amount of scheduled time in the curriculum. Early in American medical education, anatomy virtually constituted the preclinical curriculum (5). The 1896 recommendation of the Nathan S. Davis Committee, the first made by an official body for a graded 4-year curriculum, still allotted the major part of the preclinical years to anatomy (44). In 1909, it was said that "in the majority of the better medical schools of the country over 800 hours, about a fifth of the curriculum, are devoted to anatomical science" (6). However, the next decades saw a trend to free the clinical years from formal classwork and to place in the first 2 years certain courses introductory to clinical medicine (43). This, and the increasing growth and importance to medicine of other preclinical disciplines, led to curtailment of time given to morphology. In 1923, the American Association of Medical Colleges recommended that the time devoted to anatomy be restricted to 471-814 hours (37), a recommendation essentially repeated in later years (26, 27). The schools did not quickly follow this recommendation, for in 1929 a number of schools still gave over 1000 hours of anatomy (23), and the average number of hours of scheduled anatomy in 1931 was 780 (37). Reduction in time scheduled for anatomy was probably hastened by the Weiskotten report of 1939, which bluntly pointed out the inverse relationship between the number of hours scheduled for gross anatomy and the all-around excellence of the department of anatomy (43). By the time of the Swampscott conference, only 622 hours were devoted to anatomy (42)

with 770 hours as the maximum at any school (28). Much of this reduction in scheduled time was achieved by elimination of courses and greater coordination of subject material. Embryology, for example, was no longer given as a separate course by two-thirds of anatomy departments in 1955, but was incorporated in other courses (42). Perhaps in consequence, gross anatomy, for which 338 hours were scheduled on an average in 1939 (43), still occupied 330 hours in 1955 (42). It seems likely, in view of the reduction in time which has already taken place, that the teaching load in anatomy will show little further change.

There has been a long-term trend for increase in the number of teachers in the average department of anatomy (Table 5.) In the last century, one man was often responsible for teaching all of morphology (5). By 1917-19, faculties in the Universities of Chicago, Harvard, and Columbia reported full-time staffs of eight or more, and the average number of full professors per anatomy department was 1.4 in leading medical schools. By 1945-46, the ratio of full-time professors to department for all medical schools in the United States had risen to 1.8, and a further climb to 1.9 in 1950-51 and 2.1 in 1955-56 occurred (42). Comparable increases occurred at other ranks. This growth in faculty has been proportionately greater than that in student classes and reflects a trend in all basic science subjects for progressive increases in the teacher-to-student ratio. Between the years 1934 and 1939 covered by the Weiskotten report, for example, the ratio of basic science teachers of professional rank to medical students declined from 1:11 to 1:8 (43); by 1950, the ratio was 1:5 (17). Increasing recognition of the contributions of preclinical teachers to research and to graduate, paramedical and postgraduate medical teaching, may be expected to lead to still further reduc-

TABLE 5

NUMBERS OF BUDGETED POSITIONS AT THE RANKS OF INSTRUCTOR TO FULL PROFESSOR IN
DEPARTMENTS OF ANATOMY IN UNITED STATES AND CANADA*

Year:	1945-46	1950-51†‡	1955-56	1958-59
Total number positions	433	531	676	782§
Number of departments reporting	71	76	87	97
Average number positions per department	6.1	6.6	7.8	8.1§

* Sources: (31, 42).

† Hinsey found 593 anatomists in 78 medical schools in 1949-50. However, his data, taken from catalogues, was not restricted to full-time positions (17).

‡ The total number of scientists employed as anatomists in the United States in 1951 was 699. This figure includes personnel in medical school positions other than the regular academic ranks and scientists employed by industrial and governmental institutions (24).

§ United States, 706; Canada, 76; average number of faculty positions per department in the United States was 8.4; in Canada, 6.3 (31).

tion in the ratio of medical students to faculty. In anatomy there has been a persistent need for additional budgeted faculty positions to assist in teaching (15, 43), and in 1955 it was estimated that 65 positions were urgently needed and 80 others were highly desirable (42).

Teaching of dental students.—More than 160 individuals at the rank of instructor or higher are engaged, full- or part-time, in teaching anatomy to dental students (41). Perhaps a third of these teachers are in independent anatomical divisions of dental schools (14). The others are members of departments having equal responsibility to medical and dental teaching, or of a department properly belonging to a medical school. The number of anatomy departments giving instruction to both dental and medical classes was approximately seventeen in 1939 (43) and 26 in 1955 (42). Relative to the numbers of dental schools in these years, these figures indicate a trend toward the common instruction of dental and medical students by a single department.

The number of dental schools, 38 or 39 during the period 1930-1945, rose to

47 by 1959-60 (34, 39), and must grow at the equivalent rate of two new schools per year until 1971 if the present ratio of dentists to population is to be maintained (33, Chart 3). In relation to the number of existing schools, this rate of growth is greater than that projected for medical schools.

Teaching of anatomy in the dental curriculum is a comprehensive task, since gross, microscopic, and neurological anatomy of the whole body are generally studied. According to a recent survey of 30 schools, for instance, at 29 schools the thorax and arm are dissected, and at 23 schools the leg is dissected (9). Scheduled hours in gross anatomy average 270 (9), and the value for microscopic anatomy is near 150 hours (42). As with the medical curriculum, there has already been a history of reduction in the number of hours devoted to morphology, for the 1941 recommendations of the Dental Curriculum Survey Committee called for 576 hours of anatomy (38).

Teaching of paramedical students.—Several paramedical professions, such as nursing, public health, and pharmacy, as well as the newer technical vocations of

occupational, physical and speech therapy, clinical and radiological technology, lean more or less heavily on basic science departments of medical schools for their scientific foundations. Schools in physical therapy, for example, are required by their accrediting board to present 210 hours of instruction in gross anatomy, including dissection or demonstrations of cadavers (13). Schools of dental hygiene have even heavier subject requirements in anatomy (18). As the role of paramedical disciplines in medical care has become more widely appreciated, the number of schools of these subjects has increased more rapidly than medical or dental schools. Schools of dental hygiene, for instance, have multiplied from sixteen in 1944 (18) to 26 in 1950 (38) and 33 in 1960 (4). In 1936, only thirteen schools of physical therapy were recognized (26), but in 1959, there were 39 (31). Four out of five schools of physical therapy look to the anatomy department of a medical school for instruction in morphology (42). Demands for teaching assistance even in the long-established nursing profession presumably have also increased as changes in patterns of nursing care have caused ratios of nurses per 100,000 population to increase from 175 in 1930 to 216 in 1940, and 258 in 1955 (40). Approximately one-third of anatomy departments offer courses to nursing students (42).

Research and teaching of graduate students.—It would be a crippling error to base estimated requirements for anatomists solely upon predictions of teaching needs of the health professions. Fully equal responsibilities of university departments of anatomy are the teaching of graduate students and the furthering of research. Growing numbers of anatomists are entering research positions in governmental institutions or in university jobs without teaching responsibilities, and the demand for investigators

may be expected to accelerate under the tremendous impetus being given to medical science. It is estimated that 25,000 new medical scientists will be required by 1970 for the projected research effort (1). At current rates of production, 3,200 M.D.'s and 16,000 Ph.D.'s will be produced, leaving a deficit of 6,000. In the face of this widening responsibility, prediction of need for anatomists based upon increases in medical student teaching loads can only serve as a minimal estimate of total needs.

PREDICTIONS

The estimate of future demand for anatomists outlined in Table 6, indicates that the number of replacements and additions needed by 1976 will be two-thirds as great as the total number of workers in this field today. This estimate is conservative, for these important, but unevaluated factors, have not been considered in the estimate: (a) losses due to change of occupation, (b) the growing trend for individuals to enter pure research positions, (c) the relative increase in demand for teaching in dental and paramedical programs, and (d) increasing improvement in teacher-student ratios.

Personnel to fulfill this demand will continue to come from several sources. Foreign-trained anatomists, most of whom have a medical degree, will presumably enter the American profession at prevailing or increasing rates. However, the proportion of individuals entering upon a career in anatomy after graduation from an American medical school will become even smaller in view of the unfavorable financial attraction in recent years of preclinical teaching as compared with clinical practice, the predictable future scarcity of practicing physicians, and the increasing numbers of medical graduates entering specialty training. Apart from these competitive

TABLE 6

PREDICTIONS OF SUPPLY AND DEMAND FOR ANATOMISTS TO THE YEAR 1972

Demand:

A. To maintain status quo	
Present vacancies in faculty ranks	55
Replacements for retirements	300
25 retirements/year	
Replacements for deaths	72
6 deaths/year	
	427

B. To meet predicted expansion	
Anatomy departments in new medical schools	180
20 medical schools with 9 members per department;	
13 of these departments to teach dental anatomy.	

Independent anatomy departments in new dental schools	21
7 schools with 3 members per anatomy department.	

Total Requirement: 628

Supply:

Domestic medical graduates	62
10 per cent of requirements	
Foreign trained anatomists	50
8 per cent of requirements	
Ph.D.'s in anatomy	216
Based on average rate over last 4 years of 30/year, and an estimate that 60 per cent of graduates become career anatomists.	

Subtotal: 328

Deficit: ca. 300

considerations, increasing specialization with the Ph.D. degree is an expected consequence of the growing necessity for full-time study to master the complex knowledge and research techniques of the basic medical sciences.

By necessity, Ph.D. graduates with majors in fields other than anatomy may comprise an even more important source for recruitment in the future than they have in the past. The quantitative adequacy of this source is not foretold by the present data, but it is reassuring that the number of recent graduations in zoology has not declined notably (Chart 2).

The major source of future anatomists will be the Ph.D. programs of the profession itself. Unfortunately, present rates

of graduate training in anatomy are far from adequate to fulfill future needs for anatomists, if allowance is made for the fact that a large share of these graduates do not enter the working force.

FINAL COMMENT

It is urgent that the profession of anatomy decide to what degree it should stress expansion of its graduate training, or passively rely upon recruitment from sources extrinsic to the profession. Certainly, the requirements, the impositions, mounting over the next decade must be met after some fashion. How they are met may determine whether quality in teaching by the profession and opportunity for research by the individual is to be safeguarded.

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Problems in Comprehensive Medicine: A Distinction in Approaches*

DAVID M. SHAW, Ph.D.,† CLAUDE R. NICHOLS, M.D.‡ and
MORTON D. BOGDONOFF, M.D.§

Departments of Sociology, Psychiatry, and Medicine
Duke University, Durham, North Carolina

The advances in scientific knowledge that have improved the state of health of our nation and lengthened life expectancy have also greatly compounded the education and development of the physician. The basis for discriminative and intelligent care has come to rest more and more on an intimate understanding of the "basic sciences" which provide a framework for medicine: biochemistry, physiology, biophysics, pharmacology, genetics, and electronics. As these areas have been expanded, the information presented to the training physician has enlarged. By the time he is prepared to actually care for his first patient his view of the individual is considerably tempered by an array of data on molecules, enzymes, mitochondria, chromosomes, myocardial dynamics, and the like. It becomes a sizeable task to synthesize this large body of knowledge into useful techniques for effecting medical care, and it has been quite natural for the physician to attempt to place realistic limits on his area of responsibility. As a consequence of the growing complexity of medical knowl-

edge and the physician's attempt to handle this enlarging problem realistically, the many specialty divisions of medical practice have developed.

In recent decades, as the number of aged individuals in the community increased, there has been a change in the kinds of medical problems presented by ambulatory patients. An increasing proportion of patients are ill with chronic rather than acute medical disorders. As attention shifts to chronic illness, a new set of parameters becomes relevant in medical practice. Since the patient's illness complex is extended over a longer period of time, the impact upon psychological and social functioning becomes of paramount importance. Further, a growing body of research suggests that social and psychological factors may play a crucial role in the etiology and course of many chronic diseases (1, 11, 12, 15).

These two factors, increased specialization and increased occurrence of chronic illness, in part account for a movement in modern clinical medicine labeled comprehensive care. With the addition of psychological and social parameters, there has arisen a concern for the treatment of the "total" patient and not the isolated organ system (4, 5, 6, 13, 14).

This is not to suggest that an interest in understanding the patient in a comprehensive way is new. Throughout the history of medicine physicians have called attention to the importance of interper-

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† Deceased.

‡ Asst. Prof. of Psychiatry.

§ Assoc. Prof. of Medicine.

sonal factors in the care and treatment of patients. However, it is only recently that a concerted effort has been made to organize systematically programs for teaching the care of the "total" patient or the "patient as a person." Although such programs incorporate a variety of philosophies and educational techniques, the label comprehensive medicine has been affixed to this general movement. We wish to distinguish two different approaches to comprehensive medicine and suggest some of the consequences of each for medical education and the role of behavioral science knowledge in the medical complex.

One type of comprehensive care taught in several medical schools is consistent with the specialized organ system approach that has been evolving in medicine over the past 100 years. Behavioral science knowledge is treated as other specialized bodies of knowledge have been treated in medicine in the past. For example, when detailed knowledge about skin disease accumulated the specialty of dermatology evolved. In a similar fashion, the reaction to the advent of behavioral science knowledge pertaining to illness has been to add new specialists to the medical complex. Thus, a social worker, sociologist, and psychologist are included in the medical educational program; medical students are taught that these new specialties are available and that they should learn to recognize social and psychological problems of the patient so that the proper referral to a specialist can be made.

This type of comprehensive approach actually represents a further extension of compartmentalized medicine. The student physician has a new "part" of a patient to master. In addition to the usual physical examination and medical history, the student physician is advised to notice the affective status of the patient, to collect information on the patient's

financial status, to record the financial and emotional status of the patient's brothers or sisters, and to describe the family's reaction to the patient's illness. The physician examines all the different parts of the patient in search of an organ system that is diseased or malfunctioning. If a sick part is found, it is treated. If no organic disease is located, then the patient's social or psychological life is thought to need repair, and a consultation with an appropriate specialist is requested. Even possible interactions between psychological and organic factors may be viewed compartmentally in this type of comprehensive medicine. The domain of the physician may be defined as organic, and he may define his responsibility in such a way that he feels obligated to confine his attention to organic factors; this is reflected in the expressed desire to exhaust possible organic factors in illness by ordering esoteric laboratory tests, and, if these fail, considering the possibility of functional illness. It seems clear that this type of approach leaves the student with a mechanistic procedure for patient management. The emphasis is on care of a segment or organ system—not the "total" person.

The implementation of this compartmentalized approach to comprehensive care is contingent on the existence of a complex medical institution (such as an urban or university medical center). The increased specialization implied by the addition of social and psychological ancillary services presupposes either a large in-patient or out-patient operation such as that provided by a training hospital. The physician who becomes skilled, while in training, in referring his patients to a psychiatrist or social worker may find that such referrals are impossible or impractical in independent practice. If ancillary personnel are charged with the responsibility of caring for the patient's

social and psychic life, the physician can focus on the organic basis of illness. Thus, an unanticipated consequence of comprehensive care through increased specialization may cause a further constriction of the physician's view of the patient.

Comprehensive care programs, however, may be organized on a different basis in which the contributions of the behavioral sciences to medical care are effected in a less segmented manner. The formulation of an approach which considers illness as representing a reaction of the organism to external and/or internal stress is the background view for these alternative programs. Within this view, man is regarded as a psychosocial biological unit operating in an ever-changing physical and social-cultural environment (2, 3). The medical practitioner's focus of concern, therefore, is not on isolated biological, psychological, or social factors, but on the interaction and interdependence of the multiplicity of systems that may become involved in illness.

This approach to illness has implications for the physician in practice at three points: first, during the physician's examination of the patient; second, at the time of diagnosis and decision about patient management; and third, during the care and treatment process.

1. In order for the physician to care for and help the patient, he must examine the patient and collect information from him which is regarded as relevant. The implementation of an integrative comprehensive approach functions to expand the domain of the physician's concern. Attention to the patient's feelings about and psychological reaction to his illness is considered to have as much potential relevance for the care of the patient as his blood pressure. The way in which the patient's relations with others have been affected by his illness and the state of

such relations at the onset of the illness may have a determining influence on the care procedure. Thus, as the physician examines the patient and collects information bearing on his illness, he is systematically receptive to the interrelated pertinence of biological, psychological and social components of illness.

2. The problem of diagnosis for the comprehensively oriented physician is not one of deciding whether the patient's illness is "functional" or "organic." Rather, comprehensive diagnosis involves an assessment of the role that various physiological, psychological, and social factors have played in producing the individual whom the physician sees before him. It is recognized that patients have feelings about their illnesses, that patients' relationships with others are affected by their illnesses, and that these factors must be taken into account when decisions are made concerning the disposition of the patient's problems. It seems clear that these factors will more probably be of crucial importance for the chronically ill than for the acutely ill patient; but it is equally clear that they are involved to some extent in all illness.

3. It seems clear that if all illness includes social and psychological components, adequate medical care requires appropriate consideration of such factors. However, if all patients with recognized psycho-social dimensions to their illnesses were referred to psychiatrists, psychiatrists would be seeing almost all the sick people in our society. Thus, although all care and treatment skills cannot be possessed by a single physician, the practicing physician must be prepared to deal with a broad class of illness-related behavioral problems. In the event that specialists are required, the physician's responsibility is to recognize that what the medical care personnel may do to a person or any part of him has meaning and consequence, remote or immedi-

ate, for the person's feelings about himself and others.

Thus, *integrated comprehensive medicine* places the specialist in a relationship to the patient in which the patient, rather than being fragmented, is seen from the perspective of several relevant fields. The focal concept is that the various persons concerned with health care work as a communicating team. When each of the allied personnel has contact with a patient, he treats a total person; the responsibility for a comprehensive approach does not rest solely with the referring physician but is properly thought to be a function of a health team. Therefore, in the implementation of this approach, it is necessary that the physician be trained in the effective use of allied personnel in the management of his patient. However, insofar as the care of many patients encompasses the management of problems that are affected by the behavioral characteristics of the patient, the physician who functions with principles from behavioral science as a reference base will have minimal dependence on a referral system (8).

We now turn to two views of clinical problems in which behavioral science conceptions are made applicable to the integrated comprehensive approach. First, whenever illness results in impaired performance of a social role, stress is introduced into any social system of which the sick person is a part (7). With acute illness, the required adjustments in the social system are temporary. However, when chronic illness results in long-term disability, a permanent readjustment in the structure of the social system is required. For example, when a wife becomes permanently ill and is unable to perform all her wifely or motherly duties, some adjustments must be made by other members of the family. The integrated approach implies sensitivity to the dynamics of the social

system of which the patient is a part. This involves recognition that success in treating a patient may depend in large part on the activities of persons who never enter the medical complex. Further, any success a physician may have in altering the functioning of a patient will have implications for the functioning of the various social systems of which the patient is a part (9, 10). It is legitimate for the physician to be concerned with the social system in which the patient functions independent of the possible importance of the social system as an etiological factor in the patient's illness. Frequent references in the literature to the "old style family doctor" have in mind just such physician activity.

A second focus of attention for the comprehensive physician who wishes to employ the behavioral perspective is the role of the ill person, or so-called sick role. The members of most societies distinguish between their ill and well members and behave differently toward persons who are regarded as ill and those who are well. The specific ways in which an ill person is treated are culturally defined and imply a set of expectations concerning how an ill person ought to behave and react to his illness. This set of socially appropriate ways for an ill person to behave constitutes the social role of the ill person. Thus, illness may be regarded as a differentiated social status with an accompanying social role.

When a person is defined by himself and by significant others as occupying the role of the ill person, he may enter the medical complex (a hospital or the management program of an independent physician) in order to facilitate reintegration into the social system and occupancy of normal social roles. (A pseudo-medical complex such as a faith healer may be suitable in some subcultures.) If a person is not regarded as ill by himself and others, he is unlikely

to enter into a therapeutic relationship.¹ In this way, occupancy of a sick role is functionally necessary for the reduction of strain in the social system.

Whenever a person presents himself to a physician, his behavior is not only a function of his complaint but also of his occupancy of a sick role. One important function of the medical profession is to facilitate movement out of the sick role and reintegration into society. However, physicians themselves seem to recognize that for a person to move out of the sick role he must first occupy it. The doctor-patient relationship is in part predicated on the notion of helping the patient to define himself as sick or helping him to occupy the sick role. The patient should reduce his activities, pay attention to his bodily functions, enter into a dependent relationship with significant others, etc. In general, a large part of the activity of following the doctor's orders constitutes occupancy of the sick role. Further, these prescriptions of patient behavior by the physician function to sanction occupancy of the sick role. The physician, in effect, legitimizes the patient's deviance from normal roles for both the patient and his significant others.

Adoption of the framework upon which these background views are based may directly influence physician management of the patient. For example, when a patient presents himself to a physician with multiple complaints and the physician's physical findings are all negative, it may be difficult for the patient to accept a statement by the physician that he is not "sick." Clearly, the physician must consider the possibility that the patient needs to occupy the sick role and that before a return to health is effected the

¹ Eliot Freidson, Client and Colleague Control in Medical Education. Paper read at the 1959 Annual Meeting of the American Sociological Society, Chicago, Ill.

patient's occupancy of the sick role must be recognized. On the other hand, since in our society illness is defined as a temporary role, chronic occupancy may have a stigma attached to it; the comprehensive physician should be sensitive to both his feelings about a chronic patient and the patient's own feelings about his illness. Chronic occupancy of the sick role may be regarded by some patients as a refuge and by others as a bondage. In each of these cases the consequences of any given treatment procedure may be different both for the patient's illness and for the social system of which he is a part.

In summary, the employment of the comprehensive approach to medical problems may be conducted through an incorporation of the views of many disciplines into the activity of the one physician rather than by compartmentalization of these activities into many specialties. The degree to which the views and skills of behavioral scientists may be made to temper and influence the physician's management of the patient may be one measure of the comprehensiveness of medical endeavor. In the face of increasing need for care of patient problems in which behavioral characteristics are of clinical importance, the success with which we effect comprehensive care deserves our attention and review. It has been the intent of this paper to serve in part as a stimulus for such a review.

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An Experiment in Teaching Psychotherapy to Junior Medical Students

PAUL H. ORNSTEIN, M.D.*

Department of Psychiatry University of Cincinnati, School of Medicine,
Cincinnati, Ohio

This paper is a report on an experimental course which was designed to stimulate the interest of medical students in psychodynamic and psychotherapeutic thinking and to demonstrate to them the ways in which they could incorporate this approach into their future practice as general physicians.

The advances in the field of psychiatry itself and the growing awareness, in other fields of medical practice, of the value of an increased competence in the handling of emotional problems, have led many medical schools to provide the students with a greater knowledge of "Dynamic Psychiatry." A recent comprehensive statement by Levine and Lederer (8) on the undergraduate teaching of psychiatry describes what ideally should be included of psychiatry in the medical school curriculum. The philosophy, methods, and difficulties of this kind of teaching have frequently been reported (3-5, 8, 9). However, reports of the teaching of psychotherapy per se on an undergraduate level have been scarce (10). Balint makes an eloquent plea for the inclusion of such teaching in the medical curriculum in England and suggests as a model the techniques he has worked out for general practitioners (1, 2). His suggestion of supervised therapy as a method of teaching is feasible only if the student-therapist has full responsibility for his patients.

Some of the difficulties in teaching

* Assistant Professor of Psychiatry.

psychotherapy to medical students stem from the fact that the students have to be asked to step out of their usual role, in which they are nonparticipant observers: they have to leave their microscopes, test tubes, and stethoscopes behind and meet the patient unarmed with any of these more customary tools of the physician. They feel that in their role as psychotherapists they are asked to give up being doctors. They find it difficult to see *themselves* as the instruments of medical treatment in psychotherapy.

Our course has three objectives: (a) to show the students that the physician *can* become the instrument in therapy—a fairly reliable instrument with proper training and experience; (b) to show the students that there are methods in psychotherapy, methods that they can learn to use, namely, the potential, and often latent understanding of the behavioral and the verbal communications of other human beings; (c) to demonstrate that some aspects of their role as physicians doing psychotherapy are experimentally reproducible and perhaps even verifiable.

DESCRIPTION OF THE COURSE

The experimental course consisted of seven or eight weekly 1-hour sessions. It has been given five times, each time to a group of twenty or 40 Junior medical students. These students spend the bulk of their afternoons in the third year for one semester in clinical training in psy-

chiary. They have, among others, a series of eighteen sessions on "Psychiatric Treatment in Medical Practice." The experimental course, entitled "Psychotherapy in Medical Practice," has been part of these eighteen sessions.

The course consists of four parts: (a) an introduction to the general principles of psychotherapy (1 hour); (b) listening to a tape-recorded therapeutic interview with discussion of the therapeutic process (3 hours); (c) the demonstration of a hypnotically induced conflict in a volunteer student and its immediate non-hypnotic treatment in front of the class (2 hours); (d) role-playing by the students of one or two typical situations presented by patients to general practitioners (2 hours).

1. Introduction to the general principles of psychotherapy.—A historical survey is used to spotlight the feelings in the doctor-patient relationship as the main ingredient of all types of psychotherapies throughout the ages and also to show that this relationship and the verbal communication between patient and therapist as a vehicle of treatment are special applications of a ubiquitous human phenomenon: namely, influencing others and being influenced by others through the interpersonal relationship. Examples are used from nonpsychiatric sources about the use of language by one person to convey feelings to and evoke feelings and actions in others. (The Sermon on the Mount; the influence of leaders in the French Revolution on the French people; Hitler's speeches and their influence on the masses, etc.). These are followed by a discussion of language as it is used both to express and to disguise feelings. This shows the importance of the physician's being trained to be "tuned in" to the disguised or hidden meaning of language and behavior and sets the tone for the entire course. The introduction is rounded out by discus-

sions and examples of supportive, suppressive, relationship, and expressive type psychotherapies (6, 7).

2. Listening to a tape-recorded interview.—The recording used is the author's therapeutic interview (the 26th of weekly sessions) with one of his own patients. It was chosen because the patient is verbally expressive, uses symbolic language abundantly, and has physical symptoms during this session. Also, the focal conflict (the conflict that is paramount in the patient's mind and behavior during the session) became clearly evident. The resolution of the conflict leads to alleviation of the physical symptoms by the end of the hour. It also leads to a breakthrough in communication which in turn leads to further therapeutic effect. This recording provides an opportunity to demonstrate how listening may lead to understanding of the patient by the doctor. It also demonstrates that such understanding by the doctor then helps both the doctor and the patient solve the patient's problems.

The students are prepared to listen to the tape-recording by being told to jot down the key phrases, the affect-laden expressions of the patient, and to pay attention to the description of feelings, sensations, and symptoms. After having listened for about 10-15 minutes, the student group is asked to formulate the latent meaning of the key phrases and suggest what's really bothering the patient (focal conflict). They are told that it is better to have a tentative formulation in one's mind while listening to the material than none at all. Whatever happens in the therapeutic interview becomes more meaningful if one has a formulation in mind. Flexibility is stressed in discarding such tentative hypotheses if no corroboration is found, or modifying them if new key phrases suggest a modification of the original formulation.

The instructor attempts to draw in the

whole class to participate in offering key phrases and to offer various formulations of the focal conflict.

At this stage of the collective student effort to offer hypotheses, an interesting and characteristic division occurs in the group. Three sub-groups become evident: (a) those who seriously and spontaneously offer their formulations and make an effort to understand the latent meaning of what the patient says; (b) those who laugh about these attempts at understanding and express their contempt by offering wild and far-fetched formulations—later they are often surprised when they discover the correctness of their formulations; (c) those who feel that the other students "let their fantasies run wild" in an uncritical fashion. They sneer at the attempts of the rest of the class and the instructor to "read something into the case which isn't there" and give evidence of their feelings by talking to distract others, shaking their heads, and smiling contemptuously.

The instructor can focus on the third group with great advantage. He calls on the individual members of this group to openly discuss their skepticism and disapproval of this method of hypothesis formation and the formulations it yields. What are the criticisms? The students express their doubts of the validity of the use of the patient's language, the nuances and expressions he uses for a dynamic formulation. They believe in microscopic analysis of a histological slide, but not in the microscopic analysis of verbal behavior. They have difficulties in appreciating the symbolic value of words and acts. The instructor, then, referring back to his introduction, re-emphasizes the use of language by poets and writers to show how such a capacity—both to express and to understand the latent meaning—is a natural talent of human beings that can be fostered or inhibited. Explanation is given why an innate capacity

like this is liable to be inhibited: our need in this culture to repress and suppress many of our own feelings inhibits our natural talent to understand the latent meaning of the verbalizations of others in order to limit understanding ourselves.

This is illustrated by the manner in which the class handles the tape-recorded material. They are invited to "let themselves go," "let their fantasies run wild," "allow themselves to be intuitive," "less conventional for a moment," and afterwards to apply the "rational and objective" approach to check their hypotheses.

The tape-recorded material also permits an *in vivo* demonstration and recognition by the students of common defense mechanisms in the patient, such as denial, repression, projection, and rationalization and such techniques of psychotherapy as confrontation, clarification, and interpretation. At crucial points, the tape is interrupted, and the students are asked what their next move would be were they in the therapist's shoes. There is always at least one "correct" answer and a few equally good alternatives, and this again emphasizes what they can do "naturally" in understanding others and suggests the value of training and experience in developing the skill.

3. Hypnotically induced conflict and its subsequent nonhypnotic treatment.—Volunteers from the class are screened the day before by the administration of two Thematic Apperception Test cards. Card #12 BG is used as a nonspecific card. It shows a forest with a lake and an empty boat anchored to the shore. The second card #12 M shows a youngster lying in bed and an older figure leaning forward, reaching toward the youngster. This is often referred to as the "hypnotist scene." The administration of these cards aids in rapidly eliciting some of the unconscious attitudes toward and expec-

tations of the hypnotist and hypnosis. This, together with a brief interview and the instructor's knowledge of the student from previous classes, proves helpful in the selection of the hypnotic subject. This procedure is also a demonstration to the students that careful selection is a *must* in applying hypnosis in therapy and research.

After one or two "training sessions" in advance a student who quickly develops post-hypnotic amnesia is chosen for the experiment. Under hypnosis prior to the beginning of the class, a conflict is implanted and a symptomatic solution suggested. The student is told that after awakening, in the course of the ensuing conversation, he will feel insulted. He will want to hit the instructor (wish) but will be concerned about being expelled from medical school (fear), and as a result his right arm and hand will become paralyzed (symptomatic solution). The class is unaware of the nature of the conflict or the suggested symptom. The student is awakened in front of the class and at the given cue develops his symptom.

Characteristically, the student subject first denies the symptom and tries to hide it; he then tries to minimize it, and finally rationalizes its development: "I must have pressed my arm against the chair and it fell asleep." By calling to his attention that he is trying to hide his paralysis as if he were ashamed of it, one is right in the middle of therapy, and the exploration of his feelings continues as a matter of course. At first supportive techniques are used: Attempts to minimize the symptom and to rationalize it are accepted. Reassurance is given that "If the arm fell asleep as a result of pressure against the chair it should all be over in a few minutes." As a rule, the symptom does not disappear but may improve somewhat as a result of this approach, e.g., in a paralyzed arm and hand the fingers might begin to move

but the rest of the paralysis remains. After about 15 minutes, with or without some improvement, the therapist shifts to expressive techniques. There is usually a good opening for this shift in psychotherapeutic approach, because the student has begun to express annoyance and resentment to the therapist in an indirect or disguised fashion. At first, every attempt to point out that he is angry and resentful remains fruitless. The student subject denies these feelings, but at the same time his tone of voice and manner express it. This resentment and his attempt to hide it are repeatedly interpreted, and they sometimes lead to direct and affect-laden expression of resentment and hostility to the therapist. Depending on the intensity of these affect-laden verbalizations and just how far the student is able to go in expressing them, the symptom improves considerably or disappears. Occasionally the student has to be rehypnotized and the remnants of the symptom and the amnesia removed. No untoward effects of this procedure have been observed.¹

During this demonstration the whole class is intently observing what goes on between "patient" and "therapist." They are asked to make notes of their observations, jot down affect-laden key phrases, and formulate the focal conflict. Since the hypnotically induced symptom is a symbolic compromise of the two sides of a conflict, the students recognize that it represents an experimental replica of what they dealt with in the tape-recorded material. The concept of a symptom as an adaptive technique now becomes a reality to them. That such processes can be studied experimentally adds to their confidence in the use of such formulations.

¹ Details of the therapeutic process involving hypnotically implanted conflicts and their symptomatic solution will be reported elsewhere.

After the hypnotic experiment, a discussion of the patient's and doctor's behavior takes place on the initiative of the class. Participation becomes a more serious affair, and the grouping that took place during the listening to the tape-recording is absent.

A by-product of the hypnotic experiment is the opportunity to show the students some induction techniques and discuss with them the usefulness and limitations, the indications and contraindications to the use of hypnosis in therapy and in research. In this setting it is easy to emphasize the dangers inherent in the use of hypnosis by those not familiar with psychodynamics.

4. Role-playing of typical problems in general medical practice.—A student who volunteers to take the role of a patient in front of the class is given in typescript a description of the symptoms and precipitating events of a rather common problem in general medical practice. Again the symptoms present a meaningful compromise solution to the patient's conflicts. The patient (an actual case from the author's practice) gives a history of headaches and low back pain following an accident and of having seen two or three other doctors before. She was told that "nothing was wrong, there were no physical findings." She is asked not to volunteer any information, but let the doctor handle the interview. The correct diagnosis rests on eliciting all details surrounding the accident. Another student volunteers for the role of the physician and is told that he is a busy practitioner and has 15 minutes to spend with the patient.

There are some characteristic patterns in the "student-doctor's" approach to his "student-patient" that have emerged during these role-playing sessions.

1. The student-doctor assumes either the role of a psychiatrist or the role of the organically oriented general prac-

titioner and finds it difficult to integrate these roles, to investigate both the organic and the emotional sides of the problem concurrently.

2. If he assumes the role of the psychiatrist and spends the entire 15 minutes in search of the emotional factors, he finds himself at a loss at the end, not knowing what to do, how to terminate the interview. He is too unsure of himself to know what he has done or could possibly have done for the patient in the allotted time.

3. If he takes on the role of the organically minded general practitioner, he takes the somatic complaints at face value and engages in endless repetition of the organic workup, disregarding the emotional factors he sees but knows not how to approach concomitantly. If his findings are negative, he attempts to make a clumsy referral to a "nervedoctor" and is concerned about insulting the patient with this suggestion. He usually finds something organic and feels justified in sidetracking the patient and treatment on to an incidental finding ("There is nothing wrong with your back, but you have a slight anemia").

4. An almost universal pattern was the need on the part of the "student-doctor" to do something concrete at the end of the interview, such as giving the patient a prescription, even if he himself believed that it was unnecessary or would do no good under the circumstances.

The patterns of approach and the details that emerge during the role-playing session provide unparalleled opportunity for the class to discuss alternate ways of dealing with these ubiquitous problems in general medical practice. During the later part of the hour there is a chance for other students to step in and take over the role of the physician, and the class is thus exposed to a variety of attempts at diagnosis and management.

The discussion is on a very practical

level; everyone participates, and most corrective remarks or criticisms come from the students themselves. The instructor's activity is largely restricted to pulling together the pertinent and valid comments. These are organized around three main areas: (a) How to approach the patient? The way to introduce the exploration of emotional factors in an ordinary office interview. (b) How to listen with a holistic approach in mind, considering both organic and emotional factors at the same time. (c) The third point involved the doctor's use of himself as the instrument of evaluation and treatment and showing that this instrument, if properly functioning, has powerful diagnostic and therapeutic effects.

DISCUSSION

We were interested in developing a method of presentation that would capture the students' interest, stimulate their imagination, and would at the same time provide the instructor with an opportunity to deal with the students' characteristic defenses against psychiatric teaching.

What are these defenses, and how can they best be dealt with? In our experience it was valuable to think of *group resistance* in the class to psychiatric teaching, and view this resistance as arising, in part at least, out of the student's basic-science-oriented medical training, which predisposes them to "literal-mindedness" (8). This literal-mindedness constitutes a serious block to psychiatric teaching and learning. It involves an inability or limited ability to see beyond the surface meaning, to see the figurative, symbolic, or latent meaning of behavior and verbalizations. It is an inability to see more than the explicit meaning and to consider the same material on different levels of understanding.

We were not unmindful of other

sources and forms of resistance, such as their hostile, depreciatory attitude toward psychiatry based, in some instances, on their identification with members of other faculties. We are also aware of the fact that failure by psychiatrists to present their material concretely, pragmatically, in a nonprovocative and nonthreatening fashion, exaggerates the students' defensive behavior.

However, in this particular course we set ourselves the task of dealing primarily with the group defense of "literal-mindedness," because it seemed amenable to simple pedagogic methods. We hoped this would foster as much learning as the student's personal psychodynamics would permit. This was done in a setting in which some of the other defenses, especially hostile skepticism, was fully accepted. The expression of it was fostered by remarks like this: "You seem skeptical about some of our methods in trying to understand the patients' problems. Would you express this skepticism so that we all can examine the pros and cons?" When questions were put in an obviously hostile manner, they were accepted at face value, and the questions were dealt with matter-of-factly. The hostility motivating the question was not interpreted. The attitude on the part of the instructor that the students were entitled to their questions and skepticisms, and deserved a full discussion of them, seemed of importance in the diminution of the intensity of their defenses. Resistance is only a hindrance to learning if one tries to ignore it or bypass it. Dealing with it makes for lively and stimulating discussion.

The students were repeatedly confronted with the limitations their "literal-mindedness" imposed upon them in understanding behavior, verbal expressions, and the underlying psychic forces and motives. By engaging them in "speculations" about the focal conflict,

many were able to see the validity of the method or at least tentatively give up their defensive literal-mindedness. They engaged playfully in "guesswork" and were surprised at the results. It was helpful in this respect that in the recordings, the hypnotic experiment, and the role-playing there was immediate "proof" available for their formulations.

How effective is this teaching method? We have two sources of evidence for our general conclusions: (a) The students were asked to rate anonymously every course and subcourse in psychiatry as "excellent," "good," "fair," "poor," and offer their remarks and criticisms. This course has consistently averaged "excellent" and was outranked only by one, occasionally two courses that offered direct work with patients in the outpatient clinic. (b) We have also asked the current group of twenty students, who, 6 months or a year after completion of our course chose as an elective supervised out-patient psychotherapy, to evaluate their complete psychiatric training in regard to its helpfulness in doing psychotherapy. They consistently named our course among the first three that they found helpful. On this basis we feel that this course was a valuable introduction to actual work with patients and that it served as a stimulus to their choice of doing supervised psychotherapy.

Beyond its general effectiveness we were interested in determining the influence of our approach on the most prominent group defense, "literal-mindedness." A method of evaluating psychiatric teaching with respect to this defense has been developed and will be reported on later.

Questions also arise in regard to possible undesirable side-effects of teaching psychotherapeutic principles to medical students when this teaching goes beyond "supportive" and "relationship" techniques. Will the students misuse their

knowledge? Will they have enough inner controls to use their new tools? If they were encouraged to use their fantasy and intuitiveness in the teaching sessions will they be able to exercise the necessary controls in actual work with patients once they are left on their own?

Our experiences thus far have been favorable, but we realize that more extensive systematic studies are indicated. We cannot answer these questions with certainty at this point. We have had during the last two summers two groups of four medical students under U.S. Public Health Service grants for clinical training on our in-patient services under the author's supervision. These students have just completed their junior year. From their work with patients and also from the supervised psychotherapeutic work of the previously mentioned twenty students, all of whom have taken our course, we have observed that they were anxious to use their psychodynamic knowledge to *understand* their patients, but were hesitant at this stage of their training to make interpretations of unconscious conflicts. We have felt that they have not misused their knowledge and have not made unwarranted interpretations.

SUMMARY

Three methods were used to convey to the students what psychotherapy was and how it could be utilized in general medical practice: (a) listening to tape-recorded therapeutic interview, (b) the treatment of a conflict implanted under hypnosis, and (c) role-playing by the students of common problems in general practice.

These methods of teaching were also designed to decrease the students' anxiety about, and to encourage them in dealing with, the emotional conflicts of their patients.

Common defenses against psychiatry were noted. The instructor dealt with

these defenses directly and concentrated upon "literal-mindedness" as an important group defense.

Questions were raised about possible undesirable side-effects of teaching interpretive psychotherapy to medical students. Although definitive answers are not yet available to these questions, the general impressions have been favorable, and this kind of teaching was found to be a good introduction to actual supervised psychotherapy by the students themselves.

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Improved Television, Stereo, and the Two-Person Interview*

FLOY JACK MOORE, M.D.,† LISBURN CLARENCE HANES, M.D.,‡
and CLYDE ALLEN HARRISON§

Department of Psychiatry, University of Mississippi Medical Center
Jackson, Mississippi

Of the wealth of research reported today in medical literature, surprisingly little has to do specifically with research in medical education. An even smaller percentage of total printed articles on medical education pertain to education in psychiatry, an especially difficult subject to teach in that laboratory tests, precise measurements, palpation, and the like are not applicable.

It is the purpose of this brief article to report a technique which is part of an experiment now being conducted at the University Medical School in the teaching of psychiatry. This technique consists of an innovation in the closed-circuit television presentation of the psychiatric interview. Unique features of the innovation include three different but simultaneous television views of the interview-in-progress, plus stereophonic sound reproduction. The three different shots present a close-up of the patient, a close-up of the psychiatrist, and an over-all view of the scene.

Since an appreciable amount of medical education consists of giving the student first-hand experience with the patients in the setting in which he will normally be associated with them, the

teaching of psychiatry compounds the total problem of education. The additional difficulty arises because, more than in any other field of medicine, what happens in psychiatry takes place privately between two people—doctor and patient. Thus, the office of the interviewing psychiatrist can seldom, if ever, be opened to the neophyte, regardless of how badly he needs understanding of the techniques employed there. Furthermore, his presence abolishes the two-person interview, the very core of psychiatry.

In one sense, the teaching of psychiatry is the teaching of communication during a sometimes protracted series of interviews. For this field of medicine, the student must be instructed in how he can communicate with the patient and encourage the patient to communicate with him; what the patient's comments and answers mean per se and in light of his problems; what his problems are as related, and what they appear to a trained psychiatrist to be; what the facial expressions, tone and quality of the voice, and body attitudes indicate; how the verbal and the non-verbal content of the interview conflict with and support one another.

It should be evident that all this applies to all of medicine when medicine is practiced ideally, and certainly the training given students specifically in psychiatry should carry over into all other branches of medicine. However, it is absolutely essential for the psychiatrist

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† Professor and Chairman.

‡ Associate Professor.

§ Audio-Visual Technician.

to develop the ability to communicate and be communicated with, to observe people closely and objectively, and to interpret what he has seen and heard.

The problem, then, is how students can best be taught to conduct a psychiatric interview. In most fields of medicine, they can gain first-hand knowledge by direct observation: They can enter the laboratory and the operating room. They can enter the examining room and the hospital room alone or with the attending physician, usually without disturbing the patient. They can take histories directly from patients who have already been seen by trained physicians. However, they are limited to history-taking with the psychiatric patient, simply because the presence of other people on the scene changes the conditions under which the interview is conducted. Conceivably, the changes wrought by different conditions might be advantageous in some, even many, instances. However, as long as the

psychiatric interview, as such, is regarded as taking place between physician and patient alone, familiarizing the students with this particular setting and with what goes on in such a setting is one task of the teaching psychiatrist. Instruction for undergraduates emphasizes general principles of psychiatric interviewing, whereas that for residents involves specific application of those principles.

Since 1956, this department has made use of the well known one-way glass with an audio system to observe patients and thereby to teach students. This method of teaching does not lend itself, however, to presentation or application to large groups of students. It has seemed advisable, therefore, to seek a means whereby an entire class might observe an interview-in-progress and then hear a discussion of the interview by the staff. To this end, the following television set-up has been arranged: A specially designed



Fig. 1.—Photograph of three monitors with simultaneous views available to students in lecture room (posed subjects).



Fig. 2.—The office-studio, showing the planter, in which the microphones are concealed, and the one-way glass, behind which the cameras are operated. Furniture has been pushed forward to permit taking of photographs.



Fig. 3.—The office-studio with one-way glass raised to show placement of three television cameras.

room is furnished like an office and contains two concealed microphones. The latter are connected to separate amplifiers and speakers in a large lecture room (or in several possible lecture rooms or locations), where sound is reproduced in stereo. Three separate broadcast-quality TV cameras, concealed behind a one-way glass, simultaneously observe three aspects of the room. One camera displays a close-up of the patient, another camera a close-up of the doctor. To preserve per-

spective, the third camera gives a wide-angle shot of the room and the setting. These views are distributed to three separate 21-inch television monitors in the same location, or to a group of three monitors in several lecture rooms. (See end of article for a detailed list of necessary equipment.)

Arrangement of the monitors is such as to form a pyramid, with a close-up of the physician to the viewer's left, a close-up of the patient to the right, and the overview or wide-angle shot of the room above and between the other two monitors. The speakers must, of course, be so situated that the stereophonic sound reproduction is correlated with the appropriate monitor—the physician's voice coming through the left speaker in the arrangement here described, and the patient's voice from the right. The monitors are simply placed on a table sufficiently high for all students to see the three different views. The lower two monitors are, of course, on a level and close enough together that the third may be stacked on top of and between them. The arrangement allows accurate and fairly complete observation of all that is going on in the interviewing room.

The advantages are obvious, not the least of which is that, when the demonstration has been set up, one operator can control the minor changes that may be necessary and handle the entire technical side of the program. There is no "selection" by a director determining what one camera view should be displayed on all the monitors in the remote location, as is most often done in educational, as well as commercial, television. No programming, no planning, no censoring take place, unless the psychiatrist wishes to make minor alterations for protection of the patient.

If the therapist prefers, instead of showing the interview as it is being televised, he may have it photographed

and himself edit the film before showing the interview to students. Though such editing could be called a form of programming, the actual situation with all its spontaneity would not be lost, and a greater degree of consideration for the patient and the confidential nature of the interview would thereby be possible. Though technical difficulties prohibit the routine filming of this three-monitor system, once the procedure can be carried out with greater ease, these films can also be of considerable value to the therapist himself, since they enable him to study the interview and note the strengths and weaknesses of his own technique.

The question of ethics inevitably arises in connection with the recording and televising of psychiatric interviews. This

subject warrants and should receive detailed treatment in its own right. Suffice it to say at this point, however, that the television circuit here referred to is a closed circuit. Although monitors may be placed in several different lecture rooms, the only viewers are physicians (including residents and interns), medical students, nurses, and nursing students. These same individuals have access to hospital records, and if they can be entrusted with the information contained therein, they should be responsible and objective enough to observe televised interviews of a confidential nature.

Objections to this plan may be raised on the basis that anyone, including the therapist, who knows that he is being televised will act and speak less naturally and freely than he otherwise would. To

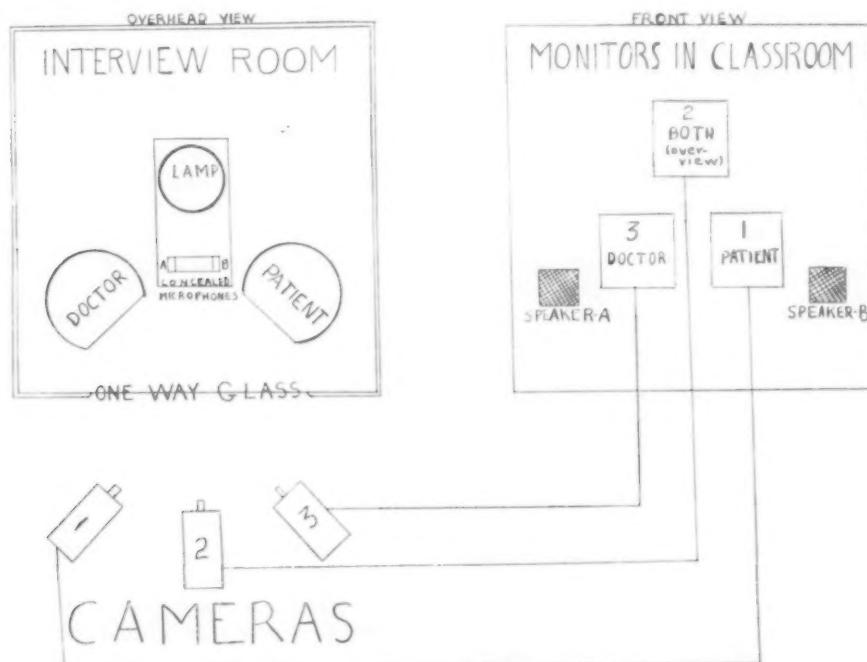


Chart 1.—Diagrammatic representation of three-monitor television and stereophonic sound reproduction system.

some extent, this is true. However, it is believed that, after an initial period of "settling down," both patient and physician for the most part forget the concealed cameras and microphones and act very much as they would in a private office.

In the light of numerous difficulties peculiar to the teaching of psychiatric interviewing to large groups, we believe that the method here described is appreciably superior to that represented by use of the one-way glass, the presence of one or two students in the psychiatrist's office during an interview, or the usual one-monitor TV system, which involves constant selection of certain camera shots to the exclusion of others. The use of three different camera views and stereophonic sound gives an entire

class a relatively true view of a two-person situation, with the best possible reproduction of voice tone and quality, facial expressions, and body attitudes.

(Equipment now in use at the University of Mississippi Medical School is listed below. Substitutions can of course be made, with corresponding qualitative changes in the video and audio reproduction.

Stereophonic Sound System: SM2 Telefunken stereo microphone system, or two Electrovoice Model 647 microphones; Dynakit Model PAS-2 preamplifier; Harmon-Kardon Citation II twin 60-watt stereo high fidelity power amplifiers; two Karlson ultra-fidelity enclosures complete with 15-inch Audax A-150-X speakers, or two Jim Lansing D37002 speaker systems.

Television Equipment: Three Dage Model 320-B/V Vidicon Viewfinder cameras, plus associated equipment, broadcast quality; three 21-inch Conrac monitors.)

Clinical Method in Psychological Medicine

T. FERGUSON RODGER, M.B., F.R.C.P.(Ed.), F.R.F.P.S.G., D.P.M.*
and

R. M. MOWBRAY, M.A., Ph.D., F.B.Ps.S.†

Department of Psychological Medicine, University of Glasgow,
Glasgow, Scotland

Undergraduate students, when discussing their instruction in psychiatry, have expressed to us their particular difficulty in transferring what they have learned of the clinical approach in internal medicine to the field of psychiatry. This difficulty is not entirely due to deficiencies in the methods of teaching psychiatry. There appears to the student to be a real difference between psychiatry and internal medicine in their scientific status. In internal medicine the clinical approach is enhanced by its involvement with the data of laboratory science, whereas psychiatry so far lacks this aura of scientific authority. In this paper we attempt to examine the nature of the clinical approach in general, its relationship to the scientific approach, and particular aspects of the clinical approach in psychological medicine.

There appear to be three kinds or levels of clinical approach which could be combined in the skill of any one practitioner but which tend to be associated with different kinds of clinicians (3). These three kinds of clinical approach differ with respect to the manner in which observations, whether of patients or of illnesses, are undertaken and with respect to the purpose of the observations. The first is concerned with the recognition of spontaneously occurring indicators of disease in order to arrive at

diagnosis and prognosis. In this approach the clinician behaves like the craftsman in that he attends quickly to what he knows to be significant, his skill develops with experience, and his work involves economy of effort. Like other crafts, it is dependent upon the assimilation of a body of knowledge which is shared with others; but expertness increases with practice until the practitioner is capable of recognizing clinically significant features with such rapidity that his steps of reasoning are not discernible to the uninitiated. This is the basic skill of all doctors, and, on the analogy with the craftsman, it is sometimes described as the clinician's art. Clinical work at this level is not in itself likely to yield new discoveries. The only traces it leaves are case records of individual illnesses.

The second kind of clinical approach represents unique instances of the first and is relatively rare. It may be described as clinical inspiration, and it involves the recognition of entirely new phenomena or of a novel relationship between previously recognized phenomena. This is essentially creative thinking and characterizes the contributions of the great names in medicine. Because it is so much dependent upon the innate ability of the individual, there would seem to be little that could be done to foster this kind of activity other than the maintaining of professional or academic patronage whereby its inhibition is prevented.

* Professor of Psychological Medicine.

† Lecturer in Clinical Psychology.

The third kind of clinical approach is that which undertakes planned observations in order to answer a properly prepared question. This activity follows procedures laid down as scientific, and its value is a function of its design or plan as much as its results. The value of the plan depends on such criteria as the appropriateness of the problem—viz., that it has not already been satisfactorily solved and that the question can be posed in such a way that it can be answered from observations which can reasonably be carried out. The operation involves placing observed phenomena in temporal and quantitative relationships with one another, attending to any variations from these relationships, and attempting to find further relationships from the variations. This is clinical science and is well documented as a method.

For our purposes we can ignore the creative or inspirational aspects and contrast the first with the third kinds of clinical approach. Walshe (4) discusses the clinical approach in his historical setting. He attributes the origin of clinical medicine in its modern form to Sydenham's return to the Hippocratic discipline in which, by the direct study of patients, the aim was to write a natural history of diseases. Abandoning the theories and abstract systems of his predecessors, Sydenham set out to describe signs and symptoms with accuracy and precision, noting the combinations and sequences of such signs and symptoms in illnesses of various kinds. By these means he was able to form concepts of disease and to found nosography. In the 18th century Sydenham's successors, according to Walshe, degenerated into mere classifiers, whose aims were to catalogue and subdivide symptoms—an arid pursuit before the necessary knowledge of physiology and anatomy was provided. The 19th century saw the beginnings of the concept of the clinic-

pathological method and the understanding of the processes at work in a disease. With this new pathology, however, there was a tendency to swing away from the notion of specific disease as a natural entity as being a fallacy of misplaced concreteness. Out of the German physiological medicine came the experimental approach, which developed into the tool of the scientific giants such as Virchow, who disparaged nosography and ignored the art of medicine in favor of the technique of the laboratory. However, around this time a concern with the specificity of aetiology was developing. Troussseau, with his proposition that "what gives the specific diseases their immutable properties is not the quantity but the quality of the morbid cause," gave new value to Sydenham's nosography. The realization was growing that the construction of typical clinical pictures was the first step in the investigation of specific pathological causes. With Pasteur's work on the micro-organism and the beginnings of bacteriology, the germ theory of disease arose to support a highly specific view of causation.

Walshe (4) points out that medicine in its present stage is depending more and more on physical and biological science for the solution of its problems, and this brings the danger of incomplete thinking instanced by the feeling that clinical method is worked out. Faced with so many other possible methods the clinician must not be tempted to abandon his clinical approach because "the one unbroken thread running through the past three centuries of medical history, sometimes hidden in the rich and intricate fabric of medical knowledge, but always holding it together and lending coherence to its pattern, is the clinical discipline. Without it medicine must become a chaos of techniques employed by clever people devoid of humanism and practical wisdom" (4).

Walshe's conclusions show that the dilemma of medicine is not dissimilar to some problems and controversies within contemporary clinical psychology and psychiatry. The clinical aspects of the psychiatrist's work are pointed out to him as being unscientific and insecure as a basis for generalization. The lawfulness of any generalization in psychology depends upon the extent to which the effects of individuality have been overcome, usually by working from objective observations on a sufficiently large scale, whereas the clinician is concerned with uniqueness and individuality. The impersonality which is achieved by the scientific psychologists is incompatible with the clinician's working attitude and lead him to echo the sentiments expressed in the quotation from Walshe above.

The adulation of scientific method which is part of our contemporary culture makes the distinction between clinical and scientific method a lopsided affair in which scientific values are over-represented. In medical training, for example, a large part of the student's time is spent in teaching him to become a practitioner of applied science. Whereas formerly the medical student would accompany his chief on the daily round and gain experience of patients right at the beginning of his studies, today the student must first be instructed in basic sciences in preparation for the future work. The foundations are laid in the subjects of physics, chemistry, and biology, and the preclinical disciplines still retain the flavor of the basic sciences. In physiology the attempt is made to explain vital processes in terms of physical and chemical laws. In this respect it is worth while pondering the claim that the inclusion of psychology or sociology in the preclinical curriculum services to offset the lack of human contact, since these subjects in their turn can be as impersonal as anatomy and physiology when

they, too, conform to the same standards of scientific objectivity.

It is claimed with some justification that the premedical and preclinical training allows the student to begin his clinical studies with a scientific attitude from which his ultimate clinical attitude will develop. However, this transfer of training may not be the most effective way of inducing clinical skills. It may be more reasonable to prepare the preclinical student by attempting to teach him some aspects of the clinician's method and mode of approach. This depends upon how far this approach is capable of being overt and communicable.

The ways in which the scientific ideal can be achieved have been fully described, since scientists and philosophers of science have been active in writing about the nature of science and scientific method. On the other hand, the task of formulating the clinical approach is difficult, partly because of the tendency for practitioners, like all craftsmen, to view their skills as trade secrets or as practices which can only be transmitted to novitiates as homilies or aphorisms, and partly because such a task would involve some degree of introspection which might not be appropriate or healthy.

There are of course statements of clinical methodology in the large numbers of "systems" of medicine which exist in textbooks. A "system" in this sense is in the nature of a compendium, a *vade mecum* or an encyclopedia of medicine in which the maximum number of facts about illnesses and their diagnosis is presented, with an occasional bonus of wise saws and practical tips in the footnotes. It offers a formal presentation of how a diagnosis should be conducted and is centered on a general scheme for case-taking which is comprehensive. What the system stresses is the ideal of systematic thinking in the clinical approach. It does not, however, specifically point to ways in

which the art of diagnosis can be discriminated from scientific method. In contemporary clinical textbooks we do not usually find the counterpart of the psychology textbook's introduction to scientific method. It may be that, because clinical skill derives from the clinician's general training and is implicit in all medical practice, it never requires an explicit statement.

However, certain features would suggest that the clinician's approach is capable of being formulated. The most general statement is that the clinician's task starts from the relationship which is established when a sick person comes to another person for help. Help does not mean simply the removal of symptoms but also involves the idea of care and support in which a sense of security is engendered in the sufferer. The goal of this relationship is the relief of suffering. Whether or not suffering is relieved is a value judgment made either by the patient or by some involved person on his behalf.

This again is an outside view of what medicine does. Any doctor would say that this was not the whole of medicine, but it is the basic or archetypal situation which underlies the concourse of disciplines, methods, fields, approaches, and techniques collectively referred to as medicine.

Clinical method originates in observations derived from noting the patient's complaint, from history-taking, and from examination; it leads to a formulation of these observations—the tentative diagnoses, expressed with some degree of probability—and involves a subsequent testing out of the formulation by further investigations or by observing the response to treatment prescribed on the basis of the formulation. The skill of the clinician is his ability to arrive at the most likely formulation and is dependent upon the clinician's ability and upon his

experience and knowledge of a wide range of data on which he can base his formulation. His medical training must be directed toward providing him with the widest possible range of relevant data or background information but also with the mode of thinking whereby he reaches the most likely organization of the facts.

It is not difficult to find a resemblance between clinical method and scientific method. In the same way as science aims at ordering observations into relationships between different levels and areas of observation, so clinical method involves the creative ordering of relationships between signs and symptoms and previously known and recognized patterns of disease.

The clinico-pathological convention, however, relates the observed sign and the reported symptom to the appropriate remedy via knowledge of the basic and underlying physiological or pathological processes. It does not operate any longer at the level at which the symptom itself suggested a remedy. If medicine were merely symptom-directed, there would be little difference between the act of the wife who helps to relieve her husband's pain by providing him with a hot water bottle and the same act prescribed by the doctor. The hot water bottle prescribed by the doctor is an agent with a different status, for its prescription has resulted from reasoning derived not merely from the generalization that hot water bottles are good for pain but from such basic knowledge of the processes involved as to indicate that the hot water bottle should be applied in this particular case.¹

To return to the wider statement, as in scientific method the clinician is seek-

¹ However, one should not forget, in stressing that the symptom-directed approach is not enough, that the empirical approach plays a large and successful part in contemporary psychiatry.

ing order from a complexity of variables. The clinician might stress, on the other hand, the importance of what he calls clinical intuition, but, insofar as his methods can be inferred, they seem to possess characteristics resembling those of the scientist, i.e., careful observation, inductive reasoning to formulate a diagnostic hypothesis, and subsequent testing of the hypothesis deductively by further observation and investigation.

We can go further with this communal-ity of scientific and clinical method and view them together with logic and mathematics as formal modes of thinking. Thinking involves the organization of concrete and abstract information into concepts through attending to points of similarity in the data and ignoring differences. The study of perception leads us to suppose that this capacity is biologically given or inherent.

Where ordinary thinking seeks through recognition of similarities to achieve the generalization as a basis for action, formal modes of thinking such as we are concerned with here are sets of rules largely independent of individual thinkers which direct thinking toward differences in the observed evidence (exceptions or atypical cases). Formal scientific or clinical methods, therefore, are refinements of ordinary thinking which have been developed in order to keep the thinking process open to new complexities and to counteract any premature closure that generalizations might impose. This would seem to hold for the clinician's art as well as for his science, for his skill has to go beyond immediate generalizations. The formulated diagnosis is an expression of some certainty which disaffirms less certain formulations and is expressed in such a manner as to allow verification by prognosis and response to treatment.

If this analysis is right it would appear that clinical art and clinical science have

much in common as members of the same class of formal thinking. The only difference is with respect to end or purpose. Science has to do with explaining, and the clinician attempts understanding. The "explainer" will view an illness in psychiatry as independent of circumstance or of the patient's biography and possessing a course and natural history of its own which can be fitted into a coherent unified scheme to which the term "logical" can be applied. His explanations will be couched in humoral, biochemical, or neurological terms. Understanding, in contrast, is alogical, being carried out without a need for formal logic, and it has as its aim the understanding of the person as a whole, as a unique individual in unique circumstances.

A simple example will illustrate the difference between explaining and understanding in psychiatry. When a person reports the experience of depression following a bereavement, we have a situation which is understandable because it is within the observer's own experience. This understanding is based on introspection, and the mechanism is sympathy or feeling and "living into" another's experience. In every-day speech a generalization can be attached to the experience by saying "everybody feels depressed when a relative dies" or more formally, as in psychopathology, by such a concept as "loss of a loved object." The notion of cause may seem to be adequately expressed in this situation by stating that the depression was caused by the death of the relative. However, if we examine an endogenous depressive illness in which symptoms and suffering have a delusional quality, we have a difficulty in dealing with the notion of cause merely on the basis of sympathy or "understanding." The reaction is greater than, and different from, the feelings of depression which can be vicariously experienced by

a noninvolved person. This is the point at which explanation has to take over from understanding, and it is because of its new-found capacity for explanation that psychiatry is gaining scientific status. The majority of medical students will respond favorably to the scientific aspects of psychiatry but will regard the understanding component as vague or esoteric, although from the point of view of psychotherapy understanding is essential.

To illustrate that it is possible to operate entirely on the basis of understanding, we may instance the Existentialist Psychopathology of Jaspers (2) and Binswanger (1). Scientific method, they hold, is too fragmentary to apply in the study of man. The sum total of the findings of all the various human sciences never adds up to a picture of man as a whole, because man is essentially more than his present and past, and experiences himself as the potential subject and agent of his future actions and decisions. The unity of man's past, present, and future is revealed only in his action, decision, and existential communication and is not amenable to science which, in its insistence upon a dichotomy between subject and object, destroys the unity in which "being" and "world" belong together.

The existential clinician's job is to "live into" the patient's experience and to attend to his communications which are never meaningless because the clinician is a fellow man who can, or is potentially able to, interpret the world in the same way as the patient does. The only basic truth to which immediate and direct access is available is personal experience.

Contrary to convention, the therapist cannot deal with the patient on the basis of his greater knowledge; he must communicate with the patient at a human

level at which he experiences anxieties and doubts; the realization that the therapist shares some uncertainty with the patient can, in fact, constitute the beginning of recovery for the patient.

The existentialist approach is too much at variance with traditional British empiricism for ease of acceptance. It might seem to represent primitive or animistic thinking in which external reality is not distinguished from inner reality. However, the existentialists' claim to turn the uncertainties, doubts, and anxieties of working with patients to therapeutic advantage serves as a reminder that in clinical psychiatry a high degree of uncertainty has to be tolerated. In some cases being scientific may be little more than a premature attempt to avoid these uncertainties.

It is almost conventional to stress the drawbacks of clinical method in psychiatry. While granting its deficiencies, we ought to react to these by improving the approach and not by discarding it in favor of scientific method. There is enough in the contemporary approaches in neurophysiology, experimental psychology, biochemistry, genetics, and the like to ensure that a full pathology will eventually be forthcoming in psychiatry. However, these advances can best be exploited by a more rigorous clinical approach; a more scientific psychiatry must await the development of an adequate clinico-pathological convention.

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MEDICAL EDUCATION FORUM

Editorials

FINANCING MEDICAL EDUCATION—A MESSAGE TO A LEGISLATURE

AUGUSTUS J. CARROLL

Through its studies of medical college financing, the Association of American Medical Colleges has learned how vitally important it can be for a medical school to explain and re-explain its functions and costs to those who are responsible for its financial support. In making such explanations a school sometimes forgets that members of its governing board, legislators, and others who decide its financial problems are not primarily in the business of medical education. To these persons the details of medical school operations can be confusing and meaningless—but not if they are accompanied by a clear explanation of the multiple functions of a medical school and the basic reasons for its relatively high costs.

The term "medical education," as it is commonly used, refers to a complex intermingling of several medical teaching, research, and service programs. To provide the kind of an educational experience necessary to produce a modern physician these functions must be combined and integrated. Therefore, an investment in medical education is also an investment in medical research and medical service to patients.

In other words, our investments in medical education produce a variety of benefits, all of which are essential to our society. The costs of these benefits are lower than when they are separately financed.

Of the total medical college investment by one university only 28 per cent can be charged to the education of new doctors. Other educational programs account for 17 per cent of the total: Ph.D.'s are educated and trained for essential teaching and research in the health sciences; hospital residents are educated and trained for medical teaching and for careers in surgery, psychiatry, and other medical specialties; and practicing physicians are given the special courses that they need to keep abreast of new developments in medicine. About 24 per cent goes for medical research, and approximately 32 per cent is for medical services provided to the nation, the state, the local community, public health agencies, hospitals, clinics, and for the direct care of patients.

To the extent that the costs of these medical college services can properly be passed on to the patients or other beneficiaries, the medical college may be reimbursed and the net cost to the college reduced.

At this point one may well ask why a medical college must do research and provide medical services? In the interests of economy, why can it not limit its activities to teaching? Here are the answers:

Medical education, when combined with research and medical services, produces better doctors, more effective research, and improved patient care. Integration of these programs makes possible the most efficient utilization of high-salaried personnel and expensive facilities. Quite often a faculty member can teach, care for patients, and do research all at the same time; and the equipment, laboratories, hospitals, and clinics essential for teaching may also be used extensively for medical research and for the diagnosis and treatment of disease.

It is the opportunity to combine teaching and research in a medical school environment that more than anything else attracts outstanding doctors and scientists to full-time faculty positions. Research enhances medical education, and education improves research. It is in our medical schools that medical research investments have yielded the greatest returns in fundamental scientific and medical knowledge.

Medical students must learn to diagnose disease and care for patients. An essential part of this learning must come from observing demonstrations by faculty members who are engaged in the diagnosis of disease and the care of patients. In addition, the students must practice what they learn; they must study patients and, under appropriate supervision, be responsible for their care. The more of this training that can take place with adequate faculty supervision and consultation the more effective the education of our new doctors will be.

The American people want and demand the best in medical care. This equals a demand for the best in medical education, because the quality of our medical education determines the quality of our doctors and the quality of our medical care. In health matters there are few people in this country who will make any concessions in their demands for excellence.

The cost of medical education always reflects the effects of an uncompromising insistence upon excellence and the multiple functions of medical education. The following factors also have an important bearing on costs:

Medical education is education beyond a bachelor's degree. In comparison with other educational programs it is necessary to employ a much higher percentage of faculty members who have either a Ph.D. or an M.D. degree, or both. Ph.D.'s are in such short supply that a medical college must pay high salaries to compete with industry and other teaching and research institutions. Clinical faculty members are medical specialists who are chosen because of their unusual competence, and this very competence would make it possible for them to obtain high income from private medical practice. To recruit and hold such personnel calls for faculty salaries considerably higher than those paid in most teaching areas.

Medical education must teach the new medical knowledge and complicated techniques that are being developed steadily by American medicine. This calls for many specialists and a high ratio of teachers for students enrolled.

In addition to ordinary educational facilities such as classrooms, medical education requires expensive scientific equipment, expensive scientific laboratories, patient care facilities including hospitals and clinics, rooms and equipment for the housing and care of experimental animals, and a great variety of teaching supplies.

Medical education costs are high when we compare them with the costs of other educational programs. However, medical education is much more than an educational program. It plays such a key role in the conservation and improvement of our health that its costs should be presented as a part of the over-all costs of health care in this country. When viewed in this perspective these costs are very low; they amount to less than $\frac{1}{2}$ of 1 per cent of the nation's total annual bill for health care.

In recent years American medicine has been advancing steadily and dramatically, with medical education as its driving force. This is not the time to look for stabilization or a firming up of medical education costs. If the universities, states, and individuals who have accepted responsibility for the sponsorship or support of medical education should attempt to regulate medical education costs by mandate or regimentation they would repudiate their solemn responsibilities to the people of this country.

This is not to say that medical education in this country is as efficient at it might be. To attain efficiency in medical education a continuous struggle must be waged at both the national and local levels. It must be waged cautiously and jointly by medical educators and the lay persons who directly or indirectly provide financial support for medical education.

ANIMAL CARE—FEDERAL OR VOLUNTARY

The issue over proper care for animals used in medical research and testing (teaching) has been raised again by the Cooper Bill and its vigorous proponents. It appears that the question will not be easily resolved, but we would hope that from the present turbulence might emerge a long-range positive program. The proposal for a Federal Bureau under H.E.W. to establish standards and police animal care facilities misses the mark completely.

Improved care for animals requires funds for facilities, for personnel, and for studies on animal care. A voluntary agency supported by national scientific organizations and the animal care groups would be far preferable to another Federal regulatory agency.

It is important for the public and our elected representatives to understand that mushrooming research programs have far outstripped the facilities and supporting personnel necessary for their most efficient operation. From 1940 to 1956, Federal medical research expenditures increased from three million to 135 million dollars; yet, no funds were made available for new facilities, save the modest categorical grants. Since 1956, a number of research institutions have constructed new research facilities, including splendid new animal facilities. In other instances, existing animal facilities have been remodeled. With better facilities, it has been possible to attract trained personnel for animal care programs. More funds are needed for animal care facilities and for trained personnel to staff them.

Direct Federal grants to support animal care programs in biological and medical research institutions would be a far wiser expenditure of Federal money than to establish another regulatory agency. Funds are also needed to establish training programs for personnel concerned with animal care.

To simply fight off the current attack is not enough. We must take leadership in a positive program to establish and apply standards for animal care.

JOHN Z. BOWERS, M.D.

FERMENT IN SCIENCE TEACHING

The past few years have seen a growing concern by educators about the teaching of science at the high school and college levels. Fortunately, this concern is now culminating in solid action which will be apparent in due course to medical educators.

The Chemical Education Material Study under the chairmanship of Chancellor Glenn Seaborg of Berkeley is preparing a new textbook for teaching high school chemistry.

Mathematicians are reviewing and revising their educational programs and media.

Four years ago the Education Committee of the American Institute of Biological Sciences initiated plans for a comprehensive review of the teaching of biology in the light of recent scientific and technical advances. Specifically, an improved sequence of life science subjects in the schools and colleges; content of courses; more effective means of presenting materials; placement of biology topics in relation to the total curriculum and special courses for exceptional students were considered as appropriate subjects for consideration.

The program was formalized in 1959 by the establishment of the Biological Sciences Curriculum Study, and progress has been exemplary.

This summer a group of biologists gathered under the auspices of A.I.B.S. prepared three new textbooks for teaching biology in high schools. One book follows the traditional pattern for a biological text, a second is concerned with environmental interactions of plants and animals, while a third emphasizes biochemical and physiological aspects.

The recent excellent reports by Aura Severinghaus and his associates have emphasized the essential nature of the relationship between preparation for medical education and the educational program in the medical school. Thus, the ferment in college and high school science teaching may be of far reaching significance to medical education.

We hope that this *Journal* will be able to communicate the results of these studies to medical educators.

As the impact of these studies is felt in the premedical programs, it should occasion a re-examination of our teaching in the basic sciences.

We applaud the ferment in the teaching of science.

JOHN Z. BOWERS, M.D.

OTHER COUNTRIES NEED PHYSICIANS

The serious shortage of physicians in many Asian, African, and Latin American countries is well known. Poverty and lack of educational facilities at all levels are usually reported as two important contributing factors in these lands.

A problem which strikes closer to home concerns the shortage of physicians in countries where economic conditions are much closer to those in the United States and educational opportunities are generally available.

As Rexed has reported in the *Journal*¹ there is a shortage of physicians in Sweden of sufficient magnitude to require the importation of medical school graduates from Middle Europe on an organized selective basis.

Many of us have understood that there was more than an adequate supply of physicians in Great Britain—indeed, an excess sufficient to require exportation, particularly to Commonwealth areas. Our surmise was based in part upon the Willink report of 1957, which recommended that the intake of students in British schools should be decreased by 10 per cent. Now Professor Francois LaFitte of Birmingham² suggests that the Willink proposals may be erroneous and that the intake of physicians in Britain should be increased rather than decreased. LaFitte, formerly associated with *The Times* of London, has been a frequent penetrating commentator on the National Health Service. He is a distinguished sociologist. Thus, his studies which indicate that intake should be rapidly increased from 12,000 to 15,000 in the British schools will receive careful consideration.

The Willink Report and LaFitte's current re-evaluation again emphasize the problems in forecasting the need for physicians.

JOHN Z. BOWERS, M.D.

¹ B. Rexed. *Journal of Medical Education*, 37:773, 1959.

² F. LaFitte and J. R. Squire. *Second Thoughts on the Willink Reports*, *The Lancet*, 11:538, 1960.

Datagrams*

FULL-TIME PHYSICIAN FACULTY BY SCHOOL OF GRADUATION

National attention is focused on the problem of providing an adequate supply of physicians to meet the needs of a rapidly expanding population. Pressures are being exerted from many sides to stimulate an immediate increase in the number of medical school graduates so as to prevent critical shortages of doctors over the coming decade.

Less attention is directed to an equally pressing problem, one which is intimately related to the first, namely, provision of an adequate supply of teaching personnel to staff the medical faculties. To stimulate any significant increase in student enrollments without providing a correlated increase in medical faculties would not be in the ultimate interests of medical education. The forward effort toward a solution of each of these problems must be timed to move in unison.

For the academic year 1959-60, eight hundred and fifty-one budgeted full-time faculty positions were unfilled. The number of unfilled positions has increased annually since 1955-56 when 251 positions were reported vacant. The anticipated increase in funds for medical research will augment the demand for full-time teachers and investigators and portends an academic deficit of considerable dimension so far as actual numbers are concerned. During this same period, however, the percentage of vacancies relative to the total number of full-time positions offered, has not changed very much, i.e. 6.6% in 1950-51 compared with 7.5% in 1959-60. (See Table 1.)

TABLE 1
AUTHORIZED AND BUDGETED BUT UNFILLED FULL-TIME FACULTY POSITIONS IN U.S.
MEDICAL SCHOOLS

Academic Year	Total Number of Unfilled Authorized & Budgeted Full-Time Positions	Total Number Full-Time Positions Offered (Filled & Unfilled Though Budgeted)	Vacancies as Percent of Full-Time Positions Offered
1950-51	279	4,212 †	6.6%
1951-52	235		
1952-53	195		
1953-54	283		
1954-55	258		
1955-56	251		
1956-57	331		
1957-58	619		
1958-59	655		
1959-60	851	11,319	7.5%

† 3,933 Full-Time teaching positions reported filled as of Feb. 1, 1951 by Diehl et al, "Medical School Faculties in the National Emergency," Jr. Med. Educ. Vol. 27, p. 233-243 (July) 1952.

Source: Education Numbers of J.A.M.A. for appropriate years.

*Submitted by the Division of Operational Studies of the AAMC, Evanston, Ill.
Source of information will be furnished on request.

Traditionally certain schools have placed more emphasis than others on the training of teachers. Current data on the relative standing of teacher-training institutions are shown in Figure 1. By a standard of measurement which is based on total numbers alone and which favors the older and larger schools, Harvard ranks first, Johns Hopkins second and Pennsylvania third, etc.

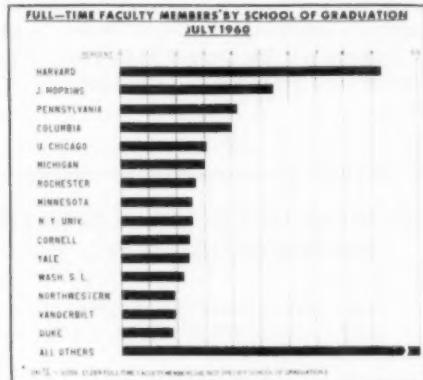


FIGURE 1

When only the more recent graduates are considered a different rank order is obtained (See Figure 2). Here the standard of measurement is the percentage of 1934-58 physician graduates holding full-time faculty appointments. By this criterion the contribution of the newer and smaller medical schools may be recognized.



FIGURE 2

MEDICAL SCHOOL EXPENDITURES IN THE U.S.: 1925-1959

This datagram presents a summary of the increases in the total expenditures for all U. S. Medical Schools for the period 1925-1959. These data include expenditures for basic operations, research and research training, but exclude those for hospitals and clinics.

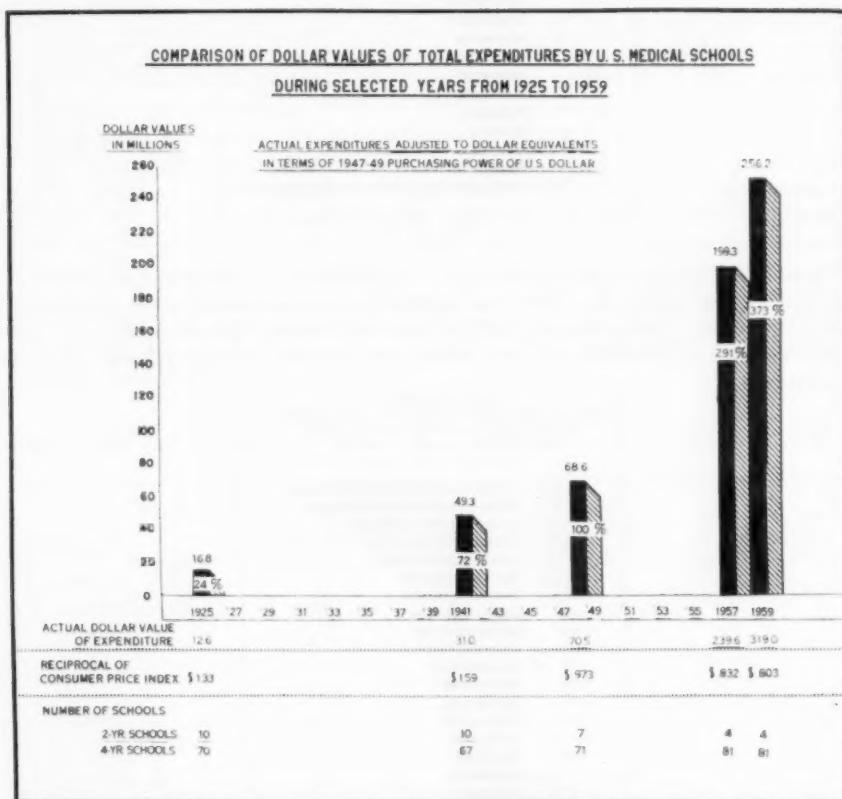


FIGURE 1

It must be remembered that the purchasing power of the U.S. dollar has shown great variation between 1925 and 1959. Therefore, if valid comparisons on medical school expenditures are to be made for stated years during this period, adjustment to a standard dollar becomes necessary. The Department of Labor, Bureau of Labor Statistics, has selected one hundred cents as a dollar equivalent for the base period 1947-1949. The 1947-1949 dollar equivalents for each of the years under consideration were determined by multiplying the actual dollar expenditure by the reciprocal of the appropriate consumer price index as determined by the Bureau.

Figure 1 provides a graphic representation of the growth of expenditures for medical education for the years 1925, 1941, 1948, 1957, and 1959, in terms of two considerations: (a) the adjusted dollar volume of total expenditures for each year noted on the graph, (b) the rate of increase in expenditures using the 1948 adjusted dollar volume of expenditures as 100% for a point of reference. The adjusted expenditures of each of the years that precede and follow 1948 are shown, in turn, as percentages of the 1948 figure.

The year 1947-1948 is a logical one to use as a basic point of reference in the history of medical school financing not only because it falls within the period shown by the Bureau of Labor Statistics for establishing a standard dollar equivalent but also because it marks the period in time when the present increased emphasis upon research and advanced education in the basic and clinical sciences, as well as great change in undergraduate education, began to develop. The expenditure increases for U.S. medical education from 1925 to 1959 are both clear and impressive.

* * *

Report

THE LUNAR SOCIETY OF KANSAS UNIVERSITY

ROBERT P. HUDSON*

The Lunar Society of Kansas University is a medical student discussion group. The Society was not begun as an educational venture. Like a hot stove, however, the Lunar Society was naturally endowed with a certain potential for teaching.

A more sophisticated curriculum cannot guarantee that the student will learn. Nor can closed-circuit television, fluorescent chalk, nor even knowledgeable professors. These things are appropriately termed teaching aids and are useful, but what we could better use are learning aids. Learning takes place only when the student, in some occult manner, alters his tympanum-brain barrier and accepts the offered material. In this extreme sense all education is self-education. The format of a Lunar Society meeting creates an atmosphere in which self-education is inescapable. Our experience with the Lunar Society suggests that the format might be used to advantage in a formal curriculum. In this way I justify a description of the organization in a journal devoted to medical education.

The original Lunar Society functioned in Birmingham, England, in the eighteenth century. Among its members were counted such scientific lights as Erasmus Darwin, James Watt, and Joseph Priestly. The original Society was devoted to the exchange of scientific information, but not for the pristine purposes of our modern scientific societies. In addition to its scientists the original Lunar Society included many of the leading manufacturers of the Birmingham Region. As it emerged the Lunar Society of Birmingham functioned principally as a market place for the scientific ideas of its members. If we can believe such a chronicler of the original Lunar Society as Dr. Robert Schofield,¹ the meetings were held on the night of the full moon to assist the horses in finding their way home in those instances when participants were rendered unreliable by the spirited evening. Needless to say, the Kansas Lunar Society has tried to retain all that was best in the Birmingham Society.

The Lunar Society of Kansas University originated in 1955. It was conceived by a medical resident who recalled a very real void in his medical education. This void was in the area which may be called the medical humanities—religion, economics, philosophy, law, ethics, politics, the man-made institutions as they apply to medicine.

This resident recalled further the eagerness with which his then student colleagues entered into discussions of the medical humanities at coffee breaks and the lunch hour. He determined to offer a prolonged version of this coffee break to his students as they rotated through his service. The idea was an instantaneous success. Two years later, after hearing a brilliant description of the Birmingham Lunar Society by Dr. Schofield, the name was shamelessly adopted by the Kansas group.

*Assistant Dean, University of Kansas Medical Center.
¹R. E. Schofield, *Ann. Science*, 12:119-136, 1956.

Now, five years after its inception, the Lunar Society is firmly entrenched as a part of the extra-curricular offerings of the medical school at Kansas University. Most of the ground rules remain unchanged. The meetings are held monthly on the Friday nearest the full moon. Attendance is voluntary. Membership is open to all interested seniors, and to juniors and sophomores by invitation. The organization is of, by, and for the medical student. Except for three preceptors² who religiously avoid the fatal apple of unsolicited opinion, no faculty member has ever attended a meeting of the Lunar Society. There are no formal lectures. The format is that of a loosely led discussion, the preceptor serving as gadfly or halter according to the tempo of the moment.

The topics for discussion are pre-announced. Participating students are expected to have prepared themselves to the extent of reading the assigned selection. The discussions last a scheduled 3 hours. In practice, the evening is usually extended an additional 2 or 3 hours and, on occasion, to my personal sorrow, has persisted to an hour more consonant with a meeting of a Solar Society.

So we have a group of volunteer medical students arriving one evening a month in the home of a staff man and prepared to take an active part in a discussion of some human problem as it applies to the physician and his profession.

The evolution of Lunar Society subject material suggests that our current medical student is not the loutish technician decried by some professorial pessimists. The first 3 years' topics exemplified by Table 1 were devoted to subjects known to produce a thalamic over-response in medical students. Among the winners were *Obstetrics of the Soul*, dealing with euthanasia; *The Physician and Human Husbandry*, treating of eugenics; and *The Incomplete Physician*, which detailed a few of the deficiencies of modern medical education. The protocols for these meetings were in the form of essays authored by the preceptors.

In 1958 a few literary selections were included (Table 2). *The Death of Ivan Ilych* was a particularly fortunate choice. Tolstoy's brilliant insight into the psychology of a dying man provided the springboard to the most stimulating evening of the Society's existence. In its success *The Death of Ivan Ilych* sug-

² Drs. Mahlon Delp, Robert Manning, and myself.

TABLE 1

LUNAR SOCIETY
1957-58

- The New A.M.A. Code of Ethics
- Obstetrics of the Soul
- The Incomplete Physician
- The Doctor and the Patient
- The Invisible Contract
- The Doctor and His Books
- The Physician and Osteopathy
- The Physician and Human Husbandry

TABLE 2

LUNAR SOCIETY
1958-59

- Organizational Meeting
- The New A.M.A. Code of Ethics
- The Communist Manifesto*
Marx
- Medical Education
- The Death of Ivan Ilych*
Tolstoy
- The Doctor and the Dollar
- The Origin of Species, and,
The Descent of Man*
Darwin
- The Origin and Development
of Psychoanalysis*
Freud

gested that carefully selected works of literature might provide a more effective point of departure than our own amateurish concoctions.

Last year, therefore, we relied entirely on literary selections (Table 3). The plan was to accumulate enough material to allow a 3-year cycle. In this way the occasional persistent sophomore would encounter no repetition. Early in our delving, we came to realize that the plethora of appropriate material would allow a cycle of such length that even the preceptors were not likely to suffer the ennui of repetition. Two criteria were used in making the literary selections. The piece had to be reasonably brief or readily abstractable, and it should contain a human problem of such universality as to be easily transposable to 1960.

Once the mentioned requirements were met the task of directing the discussion from the selection to the practice of medicine was practically accomplished. For example, the student read *Antigone*, and we discussed the dilemma of conflicting loyalties as Antigone strove to reconcile her sense of duty to the demands of two brothers, a sister, a fiance, her father, and her king. From there it was a quick step to the conflicts of duty in a physician's life—his patient, his family, his society, and himself.

We read *Madame Bovary* and pondered the motives which drove Charles Bovary to attempt the correction of poor Hippolyte's clubfoot. This led naturally to a discussion of the physician's professional conscience and the Emmas who tempt him to deny it.

We read *Autobiography of a Quack* by S. Weir Mitchell and tried to dissect out that anomalous organ in man's logical structure which renders him uniquely the fool in matters of his own health. We laughed, too, at the realization that there is a small and varying amount of the quacksalver in the scientific best of us.

We read *Anatomy in Long Clothes* and discussed the impacting effect of dogma on medical progress. In the process we swallowed a sugar-coated pill of medical history and were treated to an example of the essay at its finest. 1959-1960, the "literary year," was the Society's most fruitful to date.

The purpose of the Lunar Society, however, is not to sweeten and thereby encourage reading in the humanities. The purpose of Lunar is to assist the student in logical thinking and speaking. In the Lunar process, each participant is forced to verbalize and defend opinions. No one is allowed to simply sit, blocked at the tympanic level. The process of self-education seems to flourish under these cir-

TABLE 3
LUNAR SOCIETY
1959-60

<i>Hospital Sketches</i>	<i>The Autobiography of a Quack</i>
William E. Henley	S. Weir Mitchell
<i>Antigone</i>	<i>Confessio Medici</i>
Sophocles	Stephen Paget
<i>Generation of Vipers</i>	<i>Apology</i>
Philip Wylie	Plato
<i>Anatomy in Long Clothes</i>	<i>Madame Bovary</i>
Henry Morley	Gustave Flaubert
<i>Aequanimitas</i>	
	Sir William Osler

cumstances. The student voices his more certain opinions and has them challenged by his peers. In attempting a rebuttal he finds his reasons wanting. The next time he is more reasonable. He learns to qualify his dogma. He becomes more tolerant of the opinions of others, less secure in his own. He finds his only safe ground in a mature willingness to consider foreign concepts. When he stumbles he either jumps up or is left lying while the group moves carelessly on. He either learns or suffers what is perhaps the most devastating of human insults, that of being ignored by one's own.

We recognize that some of what we see as improvement in the student's Lunar Society performance is not necessarily an upgrading of thinking processes. Some of it is improved footwork. Every time a logical trap closes on a student he becomes more cunning. But in most "Lunys," as they are called by their irreverent colleagues, we are convinced we observe an improved ability to think logically. In a few the effect is nothing less than dramatic, and in these we recognize a pattern of sorts. This student typically arrives in the Lunar Society with a set of inflexible, inherited values which have sufficed to guide him over the relatively calm moral sea that is a Kansas small town, middle-class, Methodist adolescence. He is dogmatic, defensive, and painfully inarticulate. In this group the greatest change is seen because the greatest change is possible. It is nonetheless amusing to watch this new *torero* caping a novice with the same argument with which he himself was befuddled in the same arena a short year before.

If you would define teaching as the transference of factual knowledge, I would not offer the Lunar method as a new teaching aid. What we do see, and occasionally in startling fashion, is an almost alchemical transmutation of some rather base student attitudes in the direction, at least, of gold. From the scrutiny of his own reasons, it is a quick step to take a harder look at the reasons of others—and, thence, the reasons of the printed word. The student comes to know that in the



FIGURE 1

humanities there is no final authority. He has only to apply this conclusion to his precious science to have prepared himself for a life of receptivity to the new in medicine. He has surpassed an understanding of the scientific method. He is ready for the inadequacy of the scientific method.

With mild misgivings we infused a small amount of ritual into the Lunar Society. In retrospect I think the ritual has justified its existence. The Lunar Society has developed a camaraderie among its members which is singularly lacking in the remainder of the student body. The medical student at Kansas University exhibits a mulish indifference to organization. Medical fraternities are virtually dead. There is no Student American Medical Association. Class officers are elected only at the insistence of the administration. Lunar Society ritual, simple as it is, has conferred a valuable mantle of dignity on the organization. When he has attended five meetings, a participant becomes a member and receives a compilation of the year's reading selections and a personalized wassail cup (Fig. 1). At the end of the academic year a dinner meeting is held. In a simple ceremony senior cupholders are presented with a certificate (Fig. 2).

There are palpable objections to claiming a teaching function for the Lunar Society. Certainly no more than one quarter of the senior class is seriously exposed to the Society in a given year. This apparent defect is necessary to the success of the Lunar method. The process of self-education in the Lunar Society depends upon a small group setting in which each member can be forced into active participation.

There is, perhaps, some truth in the objection that the Lunar Society appeals to the student least in need of intellectual development. From a realistic standpoint, however, should we persist in trying for the intellectual salvation of that

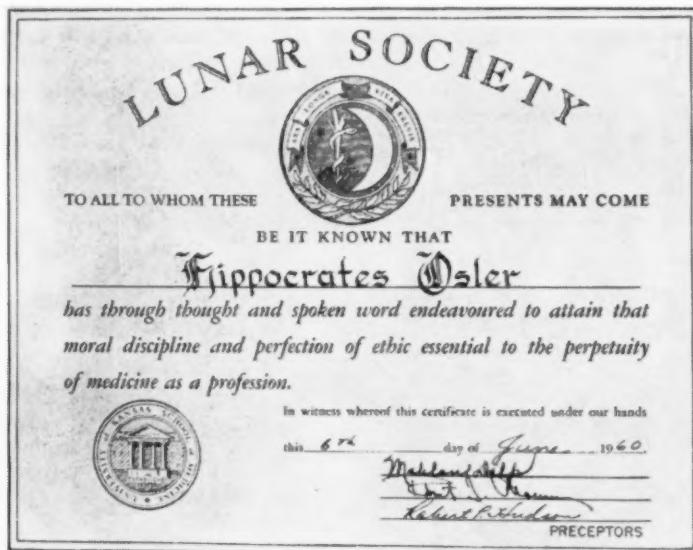


FIGURE 2

consistent segment of every medical school class which wouldn't walk across the street to hear a religious debate between Martin Luther and Pope Leo the Tenth?

A final objection to the Lunar method is that the participants do not actually learn—that they arrive with fixed convictions, pass a convivial evening in conversation, and depart unmarked by the salvoes of their colleagues. This objection has been raised in opposition to virtually every educational endeavor man has yet devised. It was nicely put a long time ago by Omar the Tent-maker,

Myself when young did
eagerly frequent
Doctor and Saint, and heard
great Argument
About it and about: but
evermore
Came out by the same Door
as in I went.

If this were true we should all exhibit the same capacity for making logical judgments that we had the day we climbed down from our mother's lap. The fallacy in Omar's declaration is so gross that it need not be dignified by statistical refutation, even if we had the tools to do so. Our experience with the Lunar Society at the University of Kansas has proved to our satisfaction that medical student attitudes toward learning can be significantly improved in an atmosphere where self-education becomes, to the student, an absolute imperative.

ACKNOWLEDGMENTS

I am grateful to Dr. Robert Manning who shared with me the birth pangs of the Lunar Society, to Mrs. Beth Delp who literally nurtured it, and to Dr. Mahlon Delp for clothing the organization in the dignity of his presence.

Communication

FORENSIC EDUCATION IN MEDICAL SCHOOLS: THE NECESSITY FOR AN INTERDEPARTMENTAL APPROACH

DON HARPER MILLS, M.D., LL.B.*

In spite of the amazing advances in technology, diagnosis, and therapeutics that American medicine has contributed to the world, there is little doubt today of the existence of a definite deterioration of medical respect and prestige of the individual practitioner and organized medicine. This is reflected in many ways, some of which are the rising tide of medical malpractice and the increasing criticism by the legal profession, citing the failure of medicine to contribute properly to the administration of justice. However, these are but symptoms of the disease which is confronting our nation today. The rapidly changing social patterns are placing increasing emphasis on the socio-medical responsibilities of the medical profession. No matter how skilled the doctor may be, if he falls short of the demands of society he loses stature. Although present-day conditions are not of his making, he can ill afford to remain stationary and become engulfed in the rush of mediocrity and absolute socialism.

Toward the solution of this perplexing problem, Forensic Medicine can make a significant contribution. This specialty encompasses the gamut of socio-medical relationships, involving all aspects of contact between law and medicine. By the very nature of this work, Forensic Medicine should be permitted to assume a greater role in the education and direction of the medical profession for the development of the obligations which medicine constructively should assume. An examination of the present effective efforts in this direction reveals that much must be done, not only within the field of Forensic Medicine, but also in the indoctrination of the medical profession generally of the need to accept some form of guidance. First, it is obvious that there are insufficient adequately trained experts in forensic medicine, including forensic pathology, who would be dedicated toward the advancement of medicine. Second, because of the lack of such men and because of reluctance to change, medical faculties in general are not prone to allow the permeation of forensic medicine into the curriculum. In those schools where forensic medicine and pathology are at all recognized, the presentation of material is often in the form of isolated lectures, without sufficient clinical correlation. This falls far short of the time and type of exposure future doctors need for their increased contribution to medicine and society.

The traditional medical school curriculum is founded upon the teaching of medical science. There can be no dispute for the necessity of this. However, along with technical advancements has come this increased accentuation of the doctor's responsibility both to society and to his patients. The failure of medical schools to accept the obligation of adequate instruction in this field not only

* Instructor in Pathology, Univ. of Southern California; instructor in Legal Medicine, College of Medical Evangelists; Deputy Medical Examiner, Los Angeles County.

places the doctor at a distinct disadvantage in his later practice, but also deprives the public of better care—something that is greatly at issue today. By reiteration, a doctor must be apprised today of his limitations, of his legal responsibility to his patients, to the courts, and to the public in general; and he must be given guideposts by which to conduct himself.

One of the proffered reasons for faculty resistance is the lack of curriculum time; and one cannot criticize a conscientious faculty for refusing to relinquish precious scientific hours for the type of medicolegal course so common today. A more basic reason, however, is the belief often held by faculty members that the aims of forensic medicine are not of sufficient magnitude to demand displacement of *any* part of the medical scientific instruction. This is unfortunate, for it indicates a certain lack of insight into the problems and obligations in the active practice of medicine. However, with properly oriented instruction in forensic medicine, the emphasis is on the supplementation, not displacement, of traditional medical teaching. The development of such a program should not only offer the student better forensic exposure than he is now getting, but it may prove to be acceptable to present medical faculty constitutions.

To accomplish this, there must be an almost complete integration of the subject matter into the total medical school curriculum. The initiation of such a program will not require significant changes in the curriculum but will involve individual programming with each major department. The teaching time will, therefore, be derived from each basic medical department according to the necessary material to be covered. The purpose, of course, is to associate as much as possible the medicolegal overtones with the scientific counterparts.

The clinical years provide the best media for forensic integration. Proper orientation of future doctors in fulfilling their obligation to the administration of justice should be undertaken particularly on the surgical and traumatic services. To this extent forensic pathology can offer much more to the medical profession than is presently accepted. It is unfortunate that this specialty is viewed by most doctors to be essentially limited to the investigation of violent death, for the basic trends in forensic pathology include nearly all relationships between trauma and disease. It must be remembered that a great many civil, criminal, and administrative actions today are concerned with nonfatal cases. Those whose opinions are sought by the courts are the practicing physicians who have some contact with the management of the cases, not the forensic pathologist! Since there has been little affirmative effort made in the teaching institution to associate the valuable principles developed in forensic pathology with "living" demonstrations, one can readily see that medicine is not equipped to provide a full share of contribution to the administration of justice. The average doctor is quite unprepared to speak adequately of the relationship of trauma and disease, of the significance of pattern wounds, of the physicochemical aspects of accidental or industrial poisonings, of alcoholism, and so forth. This can be much improved by making forensic pathology a "clinical" subject, utilizing the wealth of patient material in the traumatic, surgical, and medical services. This could be performed by expanding the presently available ward round routine to include appropriate discussions of forensic merit along with medical-surgical problems.

Professional liability or malpractice in recent years has become a significant stumbling block for many doctors, and, in a sense, for the total medical profession.

There is no indication that this will relent of its own accord; therefore, the best avenue for cure is prevention. While it would still be necessary to present several general lectures or seminars on the legal theory and requirements, the greatest assistance in malpractice prophylaxis is in the emphasis on the doctor-patient relationship and on the awareness of possible complications from various medical and surgical procedures. It is not to be implied that the specialty departments do not discuss such complications, but there is insufficient stress made upon *the way* in which they occur. It is suggested that joint faculty conferences be held with each clinical department to determine how best to stress such matters. Whether the final teaching program would utilize the services of the forensic expert should be resolved on an individual basis.

It must be admitted that no one has yet devised adequate methods of instruction concerning the doctor-patient relationship. Many educators today are stressing the increasing necessity for better medical foundations in the behavioral sciences. Although this is somewhat beyond the capacity of the forensic expert, one must not discount his qualifications to comment on certain practical aspects of this problem. It would, therefore, be advantageous for the departments of forensic medicine, psychiatry, and medicine to collaborate in organizing proper presentations.

Since the issues of criminal liability in medical practice are most apt to arise in procedures related to procreation, it is urged that integrated discussions be inserted into the clinical courses of obstetrics, gynecology, and urology at appropriate intervals. Not only would a better knowledge of such topics benefit the doctor in his practice, but he would be better informed to help sway public opinion for the adoption of statutes more in line with scientific advancement.

These are but brief illustrations to point out the value of an interdepartment approach in providing the medical student with multiple and correlated exposures to forensic problems with which he will be confronted in his later practice. The ability to handle such problems is becoming increasingly necessary in this changing society.

Letter to the Editor

The purpose of this communication is to make known the existence of the Association for Pediatric Ambulatory Service. This organization (formerly the Association of Pediatric Out-Patient Directors) has, as its objective, the promotion of improved patient care, teaching, and research in ambulatory pediatrics. The association was formally organized in Chicago on October 18, 1960, is independent and unaffiliated with any other pediatric organization. The charter members are individuals whose interests and activities are for the most part concerned with Out-Patient Department functions. Membership in the association is open, upon application, to others interested in various aspects of ambulatory pediatrics.

Meetings of the association will be held annually in conjunction with the spring meetings of the American Pediatric Society and the Society for Pediatric Research. The annual meeting will consist of two parts:

1. An open scientific program at which papers dealing with teaching, patient care and research in ambulatory pediatrics will be presented.
2. A business meeting for members of the organization.

Communications for further information concerning the Association should be addressed to Dr. Frederick Blodgett, Secretary, Grace New Haven Community Hospital, Howard Avenue, New Haven, Connecticut.

RICHARD W. OLSTEAD, M.D.
Director, Out-Patient Dept.
St. Christopher's Hospital for Children
Philadelphia, Pa.

ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.

Abstract Editor

**Education for the Practicing Physician:
The Postgraduate Program at Yale.**
ARTHUR EBBERT, JR., M.D. Connecticut
Medicine, Vol. XXIV, No. 9, pp. 560-63
(Sept.), 1960.

Interest in postgraduate education has been steadily growing since World War II, due, to a large extent, to the tremendous progress in medical science which causes any conscientious doctor to become a perpetual student. Among the many different ways of continuing medical education, the programs offered by medical schools are playing a most important role: a recent survey of postgraduate medical education in the U.S.A. shows that 90 per cent of the total postgraduate education hours were offered by medical schools (cf. D. D. Volland, *Postgraduate Medical Education in the United States*. American Medical Association, Chicago, 1955). The Yale School of Medicine, among others, has been increasingly active in this field, and this paper describes the development of its postgraduate training programs, discussing also the main problems which arose in the course of that school's experience. Emphasis, according to the author, was placed on three major types of courses for the medical practitioner: (1) review courses, designed to cover recent advances in the diagnosis and treatment of specific diseases, through a series of weekly sessions at the school; (2) informal monthly or weekly teaching conference at community hospitals, and (3) courses arranged at the school for doctors

interested in the specialties. Besides, regularly scheduled educational conferences of the Yale-New Haven Medical Center are open to all physicians. This program has evolved over a period of 12 years, frequently being subject to modification in order to meet changing needs and new challenges. It is also pointed out, however, that the Office of Postgraduate Medical Education must guard against those programs imposing an excessive burden on any staff member or department of a school. Postgraduate medical education cannot be considered as a responsibility of the medical schools alone, and therefore greater cooperation of medical societies, hospitals, health agencies, and individual doctors is required, as well as greater unity of purpose and action.

El Nuevo Centro de Salud de la Universidad Nacional Autónoma de México en la Ciudad Universitaria (The New University of Mexico Health Center in "University City"). *Gaceta Médica de México*, T.XC, No. 5, pp. 455-65 (May), 1960.

After a careful study of the health needs of its population, the Universidad Nacional Autónoma (Mexico City), in collaboration with the Medical School's Department of Preventive Medicine, has started construction and organization of a Health Center, located within the "University City" (*Ciudad Universitaria*, where most students now reside), which is to serve three types of activities: (1)

care of the student population's physical and mental health, (2) vigilance over sanitary conditions in university locales and facilities, and (3) health education for university students, faculty, and employees. As to the first service, particular emphasis has been put on mental health, since the university's most important function is to educate and discipline the activities of the mind. These are the basic objectives the Health Center seeks to attain: to stimulate a harmonious development of the student's personality; to help him resolve the psychopedagogical problems which might interfere with his vocational orientation; and to enable him to make the most of the professional training he is receiving. To carry out this work, the long experience of the present *Departamento de Psicopedagogia* (established in 1954) will be a very valuable asset, since that department will become the Center's Department of Mental Health. The Department of Psycho-Pedagogics has been carrying out a series of investigations on matters such as: geographico-professional conditions for the 58 different careers offered today by the Universidad Nacional; elaboration of tests for diagnosis and study of vocational misorientation; factors of career success and failure, etc. (according to these investigations, based on the analysis of several thousand cases, 13 per cent of the students were found to suffer from vocational or professional misorientation). It is also pointed out in the present report that one of the most important functions of the new Center is the one labeled "Health Education," by which not only the training in hygiene of the university components is meant, but, by stimulating the students' sense of social responsibility, the diffusion of their acquired knowledge among all sectors of the Mexican population which they can reach. Also discussed, with the aid of

graphic illustrations, are the architectural aspects of the Project.

Graduate Surgical Education in the Community Hospital. CHARLES D. BRANCH, M.D. Archives of Surgery, Vol. 81, No. 2, pp. 173-78 (August), 1960.

The main topic of this presidential address (read at the 17th Annual Meeting of the Central Surgical Association, Feb. 18, 1960) is the training of the surgical resident in the nonuniversity, or community, hospital. Of the total of 529 residency programs in general surgery approved for 1959, 226 (42.7 per cent) are in community hospitals. In order to better determine the role of these nonuniversity hospitals, questionnaires were sent to those located in the East North-Central and West North-Central areas of the U.S. (roughly, the geographic area of the Central Surgical Associations). Replies were received from 45 of the 73 community hospitals which in that region are approved for either 3 or 4 years' training in general surgery. The data thus obtained indicate that approximately 23 per cent of all residencies are filled by graduates of foreign medical schools, a great increase in this group having occurred through the 1949 visitors exchange program. This, the author observes, may lead to the speculation that this great increase has arisen as a service to the hospital rather than as an educational program. One of the most valuable factors in the education of a surgeon is, in the author's view, the stimulation offered by research, and it is regrettable that only a few community hospitals are able to provide adequate equipment or supervision for that purpose. If the significance of the laboratory in surgical training would be more generally known, more funds for such residency programs might be

available to the nonuniversity hospitals. Continuation of the training programs in community hospitals, on the other hand, is of vital importance, since it is now impossible for the university hospitals and medical centers to train an adequate number of general surgeons, and there is already a shortage of surgical staff, especially in the smaller hospitals. Does the community hospital, with its 3- or 4-year residency program meet the requirements to give a neophyte a firm basis for his start as general surgeon? If evaluation were based on the results of Board examinations alone, the answer would not be very favorable, since there have been poor records made by the participants in certain programs. This, in turn, has led the Board to make its minimal standards increasingly more rigid. If there is to be a true educational program in a community hospital the most important factor, in the author's view, is the ability and the availability of the staff. The total number of staff surgeons is not considered as important, in this connection, as the number of surgeons who will contribute actively to the teaching of the house staff. The point most frequently criticized in the community hospital training programs is the alleged insufficiency of cases available for the resident. However, Dr. Branch thinks that, although the resident should handle an adequate number of cases, there is no need for several hundred ones during his senior year. Operations, furthermore, should not usurp an exaggerated importance in surgical education, and emphasis should not be placed on surgical technique alone, in spite of the fact that in the public eye operations have come to represent the whole science. Another aspect considered in this paper is the importance for the surgical trainee of developing a scientific point of view. A

close rapport with the nearest medical school is essential in this matter. A careful re-evaluation of programs and the elimination of those which have as their main purpose service rather than education are also recommended by the author. He suggests that perhaps a foundation should study the programs of graduate surgical education in much the same way Abraham Flexner did for the Carnegie Foundation in 1910, in his assay of American medical schools.

Offentlicher Gesundheitsdienst und ärztliche Arbeit in Syrien (Public Health Services and Medical Work in Syria). HANS EDGAR FISCHER, M.D. Deutsche Medizinische Wochenschrift, Vol. 85, No. 35, pp. 1557-62 (August 26), 1960.

This is a survey of progress in the former Republic of Syria, now the Northern part of the United Arab Republic, since its independence from France. Whereas, under the French Mandate all public health matters had been the Ministry of the Interior's concern, since 1947 a special Department of Public Health and Social Assistance takes care of the new nation's health, in collaboration with a Health Council, WHO, and UNICEF. Health conditions in Syria vary greatly in different parts of the country. Being very unevenly settled, its largest part, the Eastern desertic region is almost uninhabited, whereas the Northern coast is as densely populated as are the large urban centers in the interior. In the coastal area of Latakia, with its humid and unstable climate, where tuberculosis is still a scourge, the Syrian government's anti-TB programs are centered. Medical mass examinations, roentgenologic and bacteriological control, as well as infant vaccination and general hospitalization measures are expected soon to show good results (there are now several TB hospitals with a total of over

1,000 beds, and in other parts of the country the disease is not widespread, thanks to a generally more favorable climate and better nutrition). Malaria has already decreased considerably, especially after the introduction of DDT in 1949; since 1953, swamps are being dried and conditioned for cultivation by European technicians and a great deal of machinery. Flies, still a major pest in other Middle Eastern countries, have almost completely disappeared from the larger Syrian cities, like Damascus. Special measures have also been taken against skin diseases, especially all forms of syphilis, which are still widespread in rural areas. Detection and treatment efforts were centered in the elementary schools, but the good results of the therapy also attract more and more adults. Vaccination against smallpox has been made compulsory and is being enforced strictly, whereas other vaccinations, such as the combination diphtheria one, for instance, are still far from general. Serum for passive immunization is available but rarely stocked by local pharmacists and must be asked for from central government offices. Extraordinary measures have been taken against a syphilis-like disease, called *Bejal* in English, which is a danger to public health among the Arabs of the Syrian-Iraq border zone. Antibiotics have proved very effective there, especially if applied at an early stage. In the fight against typhus and amebic dysentery, the department of Preventive Medicine has made good progress through drinking and bathing water sanitation, health education, and protective legislation, although hygienic and bacteriological control is still incomplete in the rural areas. A legislative feature especially discussed in this paper is the so-called "Health Card Act" which provides all persons with limited income with a card by which they and their families are entitled to free

hospital consultation and treatment. Meanwhile, efforts are under way to establish a general social security system including health service. Syria, like most Middle Eastern countries, suffers from acute shortage of health personnel. The training of nurses, above all, has become one of the most urgent tasks of Preventive Medicine. Efforts in this direction are hampered, however, by the low social status and bad reputation still attached in the Middle East to the nursing profession. A hospital network (including ambulance service) has been established and is being widened steadily: there are now about 30 government-operated hospitals in Syria, with a total of about 5,000 beds (in addition, there are in the cities a number of private clinics usually with small bedding capacity). Now most Syrian doctors are trained at the University of Damascus, and, although foreign-trained medical practitioners still enjoy greater prestige, the author points out that the efforts now being made by Syria to train their own doctors should not be underestimated. The European physician is gradually disappearing, especially since remuneration in that country is not up to Western standards. Of the Syrian practicing physicians, now numbering over 1,000, more than half are in government service. Some other aspects of medical practice in Syria and neighboring countries are also discussed by the author, who has been for some time chief surgeon at a Mission hospital in central Syria.

Symposium sobre Psicoanálisis e Investigación Social (Symposium on Psychoanalysis and Social Research). *Gaceta Médica de México*, T.XC, No. 1, pp. 49-80 (Jan.), 1960.

Held in July, 1959, at an extraordinary session of the Mexican *Academia Nacional de Medicina* this Symposium presents some aspects of the investiga-

tions carried out jointly by the Academy's "Sección de Neuropsiquiatría" and the *Sociedad Mexicana de Psicoanálisis*. In his brief introductory speech, Dr. Alfonso Millán (of the Dept. of Medical Psychology and Mental Health, Universidad Nacional Autónoma de México) honors the late Mexican philosopher Samuel Ramos, spiritual father of a national socio-cultural movement from which the present psycho-social investigations derive (cf. Ramos' principal work *El Perfil del Hombre y la Cultura en México*, written 25 years ago). The next phase of the Symposium covers the "socio-psychological study of a Mexican rural community," directed by Dr. Erich Fromm. As he points out, this study had two main purposes, one practical and one theoretical. The first, discussed here in detail, is, in brief, the gathering of all available significant information on the *human factor* which is believed to play such an important role in the economic and social progress of any community. The "theoretical" objective deals with the problem of personality, emphasis being on an analysis of the deepest and most hidden *motivations*, which, in Dr. Fromm's view, are most valuable in helping us foresee how people may respond to new stimuli and new efforts on behalf of their social and economic progress. The third paper, presented by Dr. Millán, concerns the "Program of the Department of Medical Psychology and Mental Health" of the Universidad Nacional School of Medicine. The functioning of the department is described in detail; these are, in sum, its principal activities: (a) development of a teaching program in medical psychology, with two courses, one each for the first and second year, and participation, throughout the medical student's entire career, by integrating pertinent matters into other subjects of the curriculum; (b) for each of the two special courses, a series of

practical tasks are carried out in order to stimulate the student to apply to himself the acquired theoretical knowledge and help him discover how his own mental mechanisms operate. For this kind of work diverse forms and materials are used, such as short written autobiographical narrations, relation of some dream, analysis of personal reactions and attitudes, etc. The most important material, however, is a questionnaire elaborated by Dr. Hinojosa and his collaborators of the Department's Section of Practical Work, which is also discussed at length in this paper. The questionnaire, known as MCU (Medicina, Ciudad Universitaria) investigates the basic positive factors required to build up a physician with a mentally healthy and productive personality. The last part of the Symposium deals with the so-called "Programa Legaria" of the *Instituto Mexicano del Seguro Social* (Mexican Institute of Social Security). This Institute, established following the 1943 Social Security Act, pursues economic, social, cultural, and public health activities, to which more recently "bio-psycho-social" work has been added. The program discussed refers to a low-cost housing project for about 600 of the neediest industrial worker families who had been living in the slums of Mexico City's Legaria suburb. Considering what important effects such a radical change in living conditions must produce on the family unit, the Institute initiated an investigation among the families selected to occupy the Housing Project. Its principal purpose was to collect all possible data on these people's living conditions before moving; their state of physical and mental health; interpersonal relations, etc. A follow-up study is planned after 3 years of living in their new communities. Techniques and materials applied in the investigation in progress are discussed in detail.

New Books

KENNETH E. PENROD
Book Review Editor

Abstracts

The Memoirs of Ray Lyman Wilbur. Edited by EDGAR EUGENE ROBINSON and PAUL CARROLL EDWARDS. Stanford: Stanford University Press, 1960. 674 pp. \$10.00.

The name of Dr. Wilbur is inextricably associated with Stanford University, where he progressed from student to professor to Dean of the Medical School to President of the University and finally Chancellor of the University. His life span (1875-1949) covers not only the period of development of that University but a critical period of development of medicine and medical education. In 1943, following relief from executive responsibilities, Dr. Wilbur set about reviewing his papers and began the writing of his autobiography, which was unfinished when he died. Members of his family were interested in having the work completed, and this task was assumed by Dr. Robinson, Professor of History Emeritus, and Mr. Edwards, Trustee Emeritus. They had the invaluable help of Miss Elizabeth Fordyce, who had been Dr. Wilbur's secretary, and whose knowledge of his papers was unmatched. This one-volume work, carrying introductions by the Honorable Herbert Hoover and Stanford University President J. E. Wallace Sterling, is a fascinating work by and about a truly great leader in American medicine.

Clinical Vectocardiography and Electrocardiography. By EDWARD MASSIE and THOMAS J. WALSH. Chicago: The Year Book Publishers, Inc., 1960. 572 pp. \$27.50.

In recent years vectocardiography and the vector approach to electrocardiography have proved their clinical value and have contributed immeasurably to the fundamental understanding of the electrical activities

of the heart. In this text is presented in relatively simple and direct manner the principles, methodology, and clinical applications of vectocardiography, and, wherever possible, the authors have correlated the vectocardiogram with the scalar electrocardiogram. In this way help is provided the reader to bridge the gap between conventional electrocardiography, vector electrocardiography, and vectocardiography. The authors have utilized Grishman's cube system of electrode placement to record the electrocardiograms appearing in this text. The text proper is divided into four principal sections: Part I, "The Normal Electrocardiogram and Vectocardiogram"; Part II, "The Abnormal Electrocardiogram and Vectocardiogram"; Part III, "The Cardiac Arrhythmias"; and Part IV, "Other Conditions Affecting the Electrocardiogram." Each of the chapters forming these sections contains many illustrative electrocardiograms and vectocardiograms. Numerous additional records have been collected and are presented for study in Part V.

A Textbook of Clinical Pathology. Edited by SEWARD E. MILLER with 13 contributors. 6th ed. Baltimore: Williams & Wilkins Co., 1960. 830 pp. \$15.00.

This text is designed to give the medical student, intern, resident physician, clinical pathologist, and teacher of medicine an authoritative source of information on how most advantageously to use the clinical laboratory. It portrays what tests to order, when in the course of disease to order them, how to interpret and evaluate the results; in short, the use of a clinical laboratory in differential diagnosis and in following the course of disease in patients. This approach is coupled with continued emphasis on normal function and the mechanism of disease. Continuing the major reorganization of

material and drastic redesign of chapters started in the 4th edition, completely new chapters have been written on Blood Groups and Red Cell Antibodies, Examination of Urine, Evaluation of Renal Function, Medical Bacteriology and Immunology, The Psychological Examinations for Disease, The Diagnosis of Viral and Rickettsial Disease, and the Assay of Chemotherapeutic and Antibiotic Agents. Extensive changes have taken place in the first five chapters on hematology. In addition all other sections of the book have been revised, some extensively, with the addition of much new material and with the deletion of older or obsolete material. In the interest of making the text even more useful to the student much time and energy have been devoted to the production of a detailed index with ample cross-indexing.

The Metabolic Basis of Inherited Disease.

Edited by JOHN B. STANBURY, JAMES B. WYNGAARDEN, and DONALD S. FREDRICKSON. New York: McGraw-Hill Book Co., Inc., 1960. 1424 pp. \$30.00.

This book is an effort to meet the need for a critical and comprehensive account of those heritable disorders of metabolism for which an appreciable body of knowledge now exists. It presents the pertinent clinical biochemical and genetic information concerning those metabolic anomalies which have been grouped under Garrod's engaging term, "The Inborn Errors of Metabolism." Recent studies have clarified the nature of a number of these diseases, new disclosures have brought others within the group, and indeed, new syndromes have been uncovered. In order to secure authoritative presentations the editors have enlisted the collaboration of 46 investigators actively engaged in the intensive study of specific heritable diseases. Each contributor was given ample freedom to organize his own material as he might see fit within the broad framework of a general format. He was encouraged to include sufficient normal biochemical and metabolic material in the relevant fields in order to provide a firm foundation for a detailed exposition of the nature of the defect at the heart of the disease or condi-

tion under scrutiny. He was also urged to indicate areas where further work is needed, and to hazard some speculations from existing data. In this manner an attempt is made to achieve a stimulating and contemporary interpretation of each disease against a background of normal human intermediary metabolism and physiology. Each chapter has been critically reviewed by each of the editors, and a number have been reviewed by additional readers.

The Management of Fractures and Soft Tissue Injuries. By the Committee on Trauma, American College of Surgeons. Philadelphia: W. B. Saunders Co., 1960. 359 pp. \$5.00.

This single volume combines the 7th edition of "An Outline of the Treatment of Fractures" and the 2nd edition of "Early Care of Acute Soft Tissue Injuries," both compiled by the Committee on Trauma of the American College of Surgeons. Each of the above is available separately at a cost of \$1.75 for "The Outline" and \$2.25 for "Early Care."

This 7th edition of "An Outline of the Treatment of Fractures" has been somewhat enlarged, but it is still small enough to carry in one's pocket. Some of the old illustrations have been eliminated; a few new ones have been added. The chapters on anesthesia, facial injuries, and multiple injuries are not included in previous editions. The entire book has been rewritten and revised. An effort has been made not to include subjects discussed in the "Soft Tissue Manual" which has met a great need in undergraduate and postgraduate teaching. A new and enlarged sub-committee has prepared the 2nd edition of "Early Care of Acute Soft Tissue Injuries." Material from the 1st edition has been used freely, but the entire Manual has been completely rewritten and rearranged. Uniformity has been achieved in the presentation. The chapter on First Aid has been deleted. A chapter on Bites has been added. Several chapters have been combined in the new chapter on Infection. Sections of each chapter have been given headings, and these are listed in the table of contents. No at-

tempt has been made to cover the surgery of war wounds. Likewise, surgery for mass casualties has not been included.

Mental Retardation in Infants and Children.

By ABRAHAM LEVINSON and JOHN A. BIGLER. Chicago: The Year Book Publishers, Inc., 1960. 297 pp. \$8.00.

This book was written by practicing pediatricians for all practicing physicians. It deals with retarded children, and mainly with those who live at home and who present varied problems—medical, psychological, and educational. Throughout, the child is considered as a whole. The book incorporates the results of evaluation and study in many hundreds of children seen in private practice and in hospitals. An effort has been made to correlate the medical phases as they relate to general health and to physiologic and education phases which include speech evaluation, vocational training, social service, and rehabilitation.

Congenital Malformations. Ciba Foundation

Symposium edited by G. E. W. WOLSTENHOLME and CECILIA M. O'CONNOR. Boston: Little, Brown & Co., 1960. 292 pp., 91 illustrations. \$9.00.

This symposium, with 29 participants, was held January 19-21, 1960. The factors which may lead to disorganization of embryonic and neonatal development, including heredity, viral infections, metabolic disturbances and deficiencies, drugs of various kinds and certain doses, respiratory distress, radiation, and, no doubt, others soon to be detected, require a fine discrimination in clinical observation, experimental techniques, and statistical analysis, combined with improved methods for establishing the chronology of morphological and biochemical development, and diligent patience in deciphering chromosomal abnormalities. The Ciba Symposia provide a suitable forum for such people to consider together the causes of teratogenesis, and this book contains the papers and discussions of such a meeting. Other larger international meetings on Congenital Malformations are to be held, and it is hoped that the contents of this volume will help to fertilize, organize, and bring to

successful maturity a world-wide effort to eliminate many of these avoidable calamities.

Human Pituitary Hormones. Vol. 13 of Ciba Foundation Colloquia on Endocrinology. Edited by G. E. W. WOLSTENHOLME and CECILIA M. O'CONNOR. Boston: Little, Brown & Co., 1960. 321 pp., 86 illustrations. \$9.50.

This symposium, participated in by 32 international authorities, was held in Buenos Aires immediately before the 21st International Congress of Physiological Sciences and in honor of Professor B. A. Houssay. The symposium was entirely given to considering the anterior pituitary hormones and their effects in man and animals. In all sixteen papers were presented and discussed.

Adventure to Motherhood. The Picture-Story of Pregnancy and Childbirth. By J. ALLAN OFFEN. New York: Taplinger Publishing Co., Inc., 1960. \$2.95.

While this book is on sale for the laity, there is a complete set of supplements to this volume which will not be in bookstores. These are available only to physicians for use in their practices and for distribution to their patients as indicated. This picture-story was written by a practicing obstetrician to be the cornerstone of a total program for physicians and available as a kit. The book itself avoids controversial areas, leaving these to the individual physician. It is nonencyclopedic and does not deal with abnormalities of child-bearing. The kit consists of a self-taking obstetrical history, hospital information, notebook leaves, and 23 supplementary leaflets bearing such likely titles as: Post Partum Instructions; Diabetes in Pregnancy; The Rh Factor; Cesarean Section; Constipation, etc. These addenda to the book are written in the same concise style and supply noncontroversial information about such conditions which the doctor can easily and quickly interpret in terms of the particular patient to whom it applies. The kit is conceived to allow the doctor to individualize in the case of each patient.

A Medical Greek Workbook. By JAMES A. McCULLOCH. Pittsburgh: Duquesne University Bookstore, 1959. 90 pp. \$1.95.

This paperbound workbook is designed to furnish, together with its companion "A Medical Latin Workbook," information relating to the origin of words and to provide the necessary tools and exercises for increasing the word power of students pursuing a pre-professional curriculum. The material is presented in such a way that no previous knowledge of the Greek language is prerequisite. The workbook contains the Greek prefixes, words, and suffixes which the student is most likely to encounter during his years of study in both the pre-professional and professional curricula. An ample quantity of exercises and review lessons are included to give the student an immediate facility in determining the derivation of words, their scientific meaning, and pronunciation.

Man and His Body. The Wonders of the Human Mechanism. By BENJAMIN F. MILLER and RUTH GOODE. New York: Simon & Schuster, 1960. 361 pp. \$5.95.

Written for the laity, this book describes the structure and working of each part of the body, starting with an account of life as it began in a single cell and evolved into the trillions of highly specialized cells that constitute a man. It takes the reader on

rounds of the circulatory system; points out and analyzes the remarkable functioning of his enzymes and glands; explores the nervous system—in short, touches upon all of human anatomy and physiology.

The Torch. By WILDER PENFIELD. Boston: Little, Brown & Co., 1960. 370 pp. \$4.75.

The author has utilized his love and knowledge of medicine, his sense of history, and his perception of people to re-create the ancient world of Cos, the island home to which Hippocrates returned in 432 B.C. to become master of the school of medicine founded by his father. This vivid historical novel is a fascinating story of one of the most productive periods in the life of Hippocrates. The author has brought together many new and relevant facts, so often omitted in history, concerning the life of this great physician.

Sourcebook in Psychology. A Course of Selected Reading by Authorities. New York: Philosophical Library, Inc., 1960. 330 pp. \$6.00.

Following an introductory reading guide by James Drever entitled "The Subject-Matter of Psychology," the book is divided into three parts as follows: Part I, "The Study of Behavior"; Part II, "The Maturing Mind"; and Part III, "The Study of Personality." In all, 32 authors contributed to this volume.



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By Charles O. Wilson, Ph.D., Dean, School of Pharmacy and Professor of Pharmaceutical Chemistry, Oregon State College, and Tony Everett Jones, Ph.D., Assistant Professor of Pharmaceutical Chemistry, College of Pharmacy, University of Colorado.

The American Drug Index identifies and correlates the many pharmaceuticals and medicinals available to the medical and allied professions. Ingeniously indexed and cross indexed for convenience to its user, this book provides factual data on over 15,000 preparations. Drugs are listed by generic name, trade name and pharmacologic grouping. Cross-indexing permits the finding of drugs or drug combinations even if only one major ingredient is known. Name, manufacturer, composition, synonyms (where they exist), sizes or strength, usual dose and use are given under each drug.

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NEWS FROM THE MEDICAL SCHOOLS

Albany

Albany Medical College is the third American medical school to grant departmental status to its division of post-graduate medicine. Only the Universities of Michigan and Utah have similar departments.

In announcing the establishment of the department, Dr. HAROLD C. WIGGERS, Dean of the College said, "New and frequent medical discoveries have created a great need for well organized programs of postgraduate education designed for practicing physicians. The task of providing these programs has fallen to the nation's medical schools. Educators at many of these schools realize that post-graduate and undergraduate medical education are of equal importance in establishing and maintaining high standards of professional care. Hence, post-graduate medical education joins undergraduate and graduate training as primary responsibilities of medical schools."

Dr. Wiggers said that more than 1,000 physicians currently participate in one or more phases of the department's educational program.

Dr. FRANK M. WOOLSEY Jr., division director and associate dean of the College, has been named professor and chairman of the new department. Dr. Woolsey, well known for his pioneer work in developing radio communications as a medium for postgraduate medical education, is chairman of the Audio-Visual Education Committee of the AAMC, chairman of the Council on Medical Television, and is a member of the editorial board of the NBC-RCA Medical

Radio System and the radio communications committee of the AMA.

Boston

Dr. CHESTER S. KEEFER, president of the American College of Physicians and former director of the Boston University-Massachusetts Memorial Hospitals Medical Center, has been named a University Professor at Boston University. Dr. Keefer resigned as director of the Medical Center January 1. Dr. JAMES M. FAULKNER, former medical director of the Massachusetts Institute of Technology and former Dean of the Boston University School of Medicine, has been named acting director of the Medical Center.

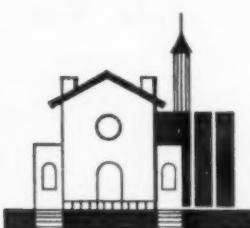
In his new position as University Professor, Dr. Keefer will undertake increased teaching and research in the university. He has been director and Dean of the Boston University School of Medicine and Wade Professor of Medicine, as well as chief of medicine at the Massachusetts Memorial Hospitals.

U. of Chicago

Dr. LOWELL T. COGGESHALL, vice president in charge of medical affairs, was one of 10 leaders of American medicine cited recently for contributions. He was selected by the editorial board of *Modern Medicine* from nominations made by deans of medical schools, leaders of professional medical organizations and readers of the journal. Dr. Coggeshall was honored specifically for his "service as administrator and medical statesman and achievements in tropical medicine."

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By DAVID D. DeWESE, M.D., Clinical Professor of Otolaryngology, University of Oregon Medical School, Portland, Oregon and WILLIAM H. SAUNDERS, A.B., M.D., Associate Professor of Otolaryngology, Ohio State University College of Medicine, Columbus, Ohio. New, 1960, 464 pages, 6 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ ", 354 illustrations. Price, \$8.75.

Prior-Silberstein PHYSICAL DIAGNOSIS — The History and Examination of the Patient

If you agree with the experienced teachers who authored this modern Mosby textbook that the fundamental objective of a modern course in "Physical Diagnosis" is to teach the student how to obtain a good history and to perform a systematic physical examination, you may find that this book more than adequately fulfills your textbook requirements. Written with a realistic approach to the problems which confront the medical student facing for the first time the many challenging and bewildering clinical problems of a practicing physician, this book is the only text which provides the student with all of the following essential information: (1) It devotes particular attention to the student's approach to his patient. (2) It profusely illustrates with diagrams and photographs the techniques of the physical examination. (3) It eliminates eponyms, yet aids students in achieving fluency in medical communication. (4) It provides a detailed review of body systems and helps the student to learn new clinical terms.

By JOHN A. PRIOR, M.D., Professor of Medicine, Ohio State University College of Medicine, Columbus, Ohio and JACK S. SILBERSTEIN, M.D., Clinical Associate Professor of Medicine, Ohio State University College of Medicine, Columbus, Ohio, and 8 contributors. 1959, 388 pages, 6 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ ", 193 illustrations. Price, \$7.50.

Cincinnati

Dr. JOSEF WARKANY, professor of research pediatrics at the College of Medicine and fellow of the Cincinnati Children's Hospital Research Foundation, has been elected first president of the Teratology Society. This is a new international organization devoted to studying the cause and prevention of congenital malformations or birth defects.

The Society will hold its first official meeting in May in Cincinnati.

Creighton

A six-year grant totaling \$173,328 has been received by the medical school for undergraduate training in psychiatry. The grant, made by the Public Health Service, will be administered by Dr. JAMES D. MAHONEY, director of psychiatry, and will be used to buy teaching equipment and supplies for clinical training.

Georgetown

Dr. THOMAS F. KELIHER has been appointed to the full-time staff of the department of internal medicine as associate professor of medicine. Dr. Keliher, who took over his new duties January 1, will also be the director of the diagnostic clinic at the Medical Center, succeeding Dr. ARMON CAIRO who will begin advanced training in psychiatry.

Dr. CHARLES A. HUFNAGEL, professor of surgery, was cited by the editorial board of *Modern Medicine* for his development of surgical techniques for treating heart and great vessel disorders. He is the creator of plastic substitutes for heart valves and blood vessels and has made other pioneering contributions to cardiovascular surgery.

Hahnemann

A grant of \$645,667 from the Pennsylvania Department of Welfare through

the Federal Hill-Burton Act has been made to Hahnemann Medical College and Hospital for the construction of a new student nurses' residence. The new seven story building will house 220 student nurses. Beside classroom facilities, the building will contain nursing arts laboratories and a library. Construction is expected to begin in June.

Dr. CARL C. FISCHER, professor and head of the department of pediatrics, was elected vice-president and president-elect of the American Academy of Pediatrics at the international medical association's annual meeting in Chicago recently.

Johns Hopkins

Dr. SEYMOUR S. KETY has been appointed professor and director of the department of psychiatry at the Johns Hopkins University School of Medicine and psychiatrist-in-chief of the Johns Hopkins Hospital. Dr. Kety, who succeeds Dr. JOHN C. WHITEHORN, is now chief of the laboratory of clinical science of the National Institute of Mental Health in Bethesda, Md.

Dr. Kety is editor-in-chief of the *Journal of Psychiatric Research*, associate editor of *Experimental Neurology*, and a member of the editorial boards of *Psychopharmacologia* and the *Journal of Neurochemistry*.

Dr. JEROME D. FRANK, who has been acting director of the department of psychiatry since Dr. Whitehorn's retirement in June, 1960, remains with the medical faculty as professor of psychiatry.

Marquette

Creation of two new departments in the division of radiology and appointment of one department head was announced recently by the school's Dean, Dr. JOHN S. HIRSCHBOECK.

Dr. JOHN R. AMBERG, director of radiology at Milwaukee County Hospital, has been appointed associate professor and chairman of the new department of diagnostic radiology. Also established in the academic expansion was the department of radiation therapy, which will be headed temporarily by Dr. S. B. MORTON, director of radiology at Columbia Hospital, Milwaukee, and chairman of the radiology division.

Creation of the new departments is part of the academic expansion program of the medical school. Departments of physical medicine, plastic and reconstructive surgery, history of medicine and occupational and environmental medicine were added previously.

The school has been awarded a Public Health Service training grant totaling \$89,775 for a five-year combined studies program leading to the two degrees of Doctor of Medicine and Doctor of Philosophy in Pharmacology. Candidates will be selected from students who have completed, at their own expense, the first two years at any one of the country's 85 medical schools. While on the combined program in the succeeding five years, students will be financially supported by the grant and will complete the two clinical years in medicine and three years in pharmacology.

Meharry

A \$622,000 Hill-Burton grant has boosted Meharry Medical College's endowment funds to \$1.5 million in its long-range \$20 million development program. According to university sources, the federal money will be used to build a \$1.5 million wing at Hubbard Hospital, operated by Meharry.

Miami

The School of Medicine has organized a special three month postgraduate re-



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refresher course for the Cuban refugee physicians who have fled to the Miami area. More than 200 signed up for the first course which began January 9.

The program, supervised and planned by Dr. RALPH JONES Jr., professor and chairman of the school's department of medicine, will be given three evenings a week at the medical school's teaching hospital. Associated in the program are a number of former professors at the University of Havana Medical School. It is estimated that more than half the Havana medical faculty and a good proportion of the practicing profession have left Cuba and are now in Miami.

The course will be given in English, but simultaneous translation is provided in Spanish, so that the Cuban physicians will have an opportunity to improve their language facility and their medical knowledge at the same time.

Mississippi

Dr. CHARLES C. RANDALL has been named an assistant dean of the School of Medicine in charge of graduate studies in the medical sciences. Dr. Randall is professor of microbiology and chairman of the department, having come to the Mississippi Medical Center from Vanderbilt University School of Medicine in 1957.

New York University

Dr. RAYMOND S. JACKSON, administrator of University Hospital at the New York University Medical Center, has been designated University physician and director of University Health Services. He succeeds Dr. DOUGLASS S. THOMPSON, who resigned recently to accept a similar post at the University of Pittsburgh. Dr. Jackson will combine his new position with his responsibility as associate professor of medicine at the NYU Medical Center.

North Carolina

Dr. FLOYD W. DENNY Jr., has been named head of the department of pediatrics. He succeeds Dr. E. C. CURNEN Jr., who recently accepted a similar position with Columbia University College of Physicians and Surgeons.

Dr. Denny comes to the NC School of Medicine from Western Reserve University School of Medicine. He has also served on the medical faculties at Minnesota and Vanderbilt.

Oregon

The American Cancer Society's Oregon division has established a chair of cancer research at the medical school. A maximum of \$20,000 annually will be paid as salary to the occupant of the chair. The purpose of the chair is to "enlarge the scope of research in the cancer field, train men in research, and stimulate re-

search in the field of cancer by others at the school."

Pennsylvania

Two "weather sensitive" female arthritis patients stepped into an airtight Controlled Climate Chamber January 16, where they remained voluntarily incarcerated for three to four weeks, helping science determine the effect of weather conditions on rheumatoid arthritis and related diseases.

The \$125,000 Controlled Chamber, just completed at the Hospital of the University of Pennsylvania, is believed to be the only one of its kind in the world providing for long-term occupancy under weather conditions which can be changed in respect to temperature, relative humidity, barometric pressure, rate of air movement, and air ionization—or any combination of these varying factors.

The program is under the direction of Dr. JOSEPH HOLLANDER, associate professor of medicine.

While the major purpose of the research program is in the field of arthritis, Dr. Hollander said many unrelated observations of medical value can be carried out at the same time with the same patients. Psychiatrists too are expected to be interested in the incarcerated patients' emotional response to weather changes.

Pittsburgh

Dr. DOUGLASS S. THOMPSON, assistant professor of medicine and director of health service at New York University, has been named director of student health services at the university.

With Dr. Thompson's appointment, the student health services will be placed under one director, and will be integrated with the newly expanded department of preventive medicine in the Pitt School of Medicine.

Rochester

Dr. WILLIAM L. PARRY, former chief of the urology section, Veterans Administration Hospital, Syracuse, has joined the UR School of Medicine and Dentistry as associate professor of urological surgery. He also will be senior associate surgeon in Strong Memorial Hospital, where he took his residency from 1948-52.

Stritch

The Rev. WILLIAM J. DEVLIN, S. J., a priest-physician psychiatrist at Loyola University, died of an apparent heart attack January 8. Holder of seven academic degrees and member of more than a dozen societies, he had dedicated his career to healing the "whole man."

A staff member of Loyola since 1949, he had been its professor of psychiatry and neurology since 1953, and was head of the psychiatric division of Loyola's Stritch School of Medicine.

Medical College of Virginia

The National Institute of Health has awarded the first grant for advanced study in medicinal chemistry to the Medical College of Virginia.

Funds totaling more than \$58,000 will be used to create two fellowships each year for three years, beginning in 1961. They will be offered to graduate students in the MCV department of chemistry and pharmaceutical chemistry, for training in fundamental chemistry and in the techniques and vocabulary of the biologist in medical research.

Dr. WALTER H. HARTUNG, chairman of the chemistry department, said the grant will help achieve one of his long-sought goals: the break-down of some of the barriers now existing between biologists and chemists working on medicinal projects.

West Virginia

The School of Medicine's proposed internship program has been unconditionally approved by the AMA's Council on Medical Education and Hospitals. Fourteen internships will become available on July 1, 1961. Graduates of any medical school in the U.S. or Canada will be eligible to apply. Those accepted will be trained in all the medical specialties, with special emphasis on medicine, surgery and pediatrics. Interns also may elect to spend slightly more time in one specialty field than in others.

In announcing the program, Dr. KENNETH E. PENROD, vice president for medical affairs, pointed out that the approval of the internships constitutes the third step in the university's medical education program. Already in progress is the education of medical students for a full four years and the training of residents in various specialties.

Dr. ROBERT R. TROTTER has been appointed clinical associate professor of surgery and chairman of the division of ophthalmology. Dr. Trotter comes to WVU from a position on the Harvard University medical faculty and the Massachusetts Eye and Ear Infirmary staff.

Western Reserve

Dr. CHARLES I. THOMAS has been appointed professor of ophthalmology and director of that division at University Hospitals. He has been on the staff of University Hospitals and on the faculty of the school of medicine since 1940. In 1952 he was named associate clinical professor of ophthalmology. Author of a textbook on the cornea, Dr. Thomas is a member of the council of the Eyebank of Sight Restoration in New York and is vice president and medical director of the Central Eyebank for Sight Restoration in Cleveland.

ITEMS OF CURRENT INTEREST

Health, Education, and Welfare Appointments

The naming of Dr. Luther L. Terry by President John F. Kennedy as Surgeon General of the U. S. Public Health Service, surprised the speculators who had not linked his name to the post. Dr. Terry comes to the position from the National Heart Institute where he was assistant director.

A graduate of Birmingham-Southern College (Ala.), Dr. Terry received his M.D. degree from Tulane University School of Medicine in 1935. He began his teaching career in 1939 at Washington University in St. Louis, Mo., as an instructor in medicine. In 1940 he moved to the University of Texas, Galveston, where he remained until 1942. Dr. Terry joined the medical faculty at Johns Hopkins in 1944, where he served as assistant professor of medicine until his present appointment.

Active in government affairs since 1945 when he was a member of the Medical Division of Strategic Army Survey to Japan, Dr. Terry has taken on many special assignments. He was a staff member of the subcommittee investigating malmedy atrocities for the Senate Committee on Military Affairs in September 1949, and has chaired the Medical Board of the Clinical Center, NIH; the Steering Committee, Medical Board of the Clinical Center; and the Cardiovascular Research Training Program of NIH. In addition to his position as assistant director of NIH, he was also director of the residency training program.

Other H-E-W Appointments . . . Boisfeuillet Jones, former vice president and administrator of health service at Emory University and well known for his dili-

gent work as chairman of the Committee of Consultants on Medical Research, was named by President Kennedy as Special Assistant for Health and Medical Affairs to H-E-W Secretary Abraham Ribicoff. Mr. Jones is the fifth man and the first non-M.D. to be appointed to the post.

A native of Georgia, Mr. Jones received a law degree from Emory in 1937. He served with the National Youth Administration from 1935 to 1943, rising to regional administrator for the South. He was a Navy lieutenant stationed at the Bureau of Ordnance in Washington from 1943 to 1946. Mr. Jones was appointed assistant to the President of Emory in 1946 and became Dean of administration two years later. He was appointed administrator of Health Service in 1955 and shortly thereafter rose to vice president. He also was an assistant professor of political science from 1946 to 1952. Mr. Jones was a member of the Democratic Party's National Advisory Committee on Health Policy, chairmanned by Dr. Michael E. DeBakey, head of the surgery department at Baylor's College of Medicine . . . Lealon E. Martin is joining Dr. James Watt's office as his staff assistant for scientific and public information. Watt is Director of the National Heart Institute . . . Clifford Johnson has been named chief of the Office of Research Information in the Public Health Service's National Institutes of Health.

Government Notes

Bill proposed before Congress . . . that a national medical school, patterned after West Point and Annapolis be established. M.D. graduates would serve for a given

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2nd edition

Revised by JOHN HOWKINS, M.D., Obstetrical and Gynaecological Surgeon, St. Bartholomew's Hospital, London

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period—probably five years—in the Armed Services or the Public Health Service. Introduced by Rep. F. Edward Heber (D.La.), the bill proposes Washington, D.C., as the site, so that the school can function in connection with the Walter Reed Medical Center, the Bethesda Naval Hospital and the National Institutes of Health. Rep. Herbert says that with such a school, the peacetime M.D. draft could be stopped.

MEND News

The first two MEND symposia of the 1960-61 academic year were held on October 17-19 and December 7-9, 1960. The first, "New trends in aerospace medical research," conducted at Wright-Patterson Air Force Base, Ohio, drew 135 registrants. The second, held at the Walter Reed Army Institute of Research, dealt with "Defense against chemical and biological warfare" and was attended by 195 representatives of medical schools and governmental agencies, the greatest number yet registered at a MEND-sponsored meeting.

The annual MEND Coordinators' Conference was held at the Palmer House in Chicago on Saturday, Feb. 4. Presentations included reports of MEND activities at several medical schools. Also under discussion were such topics as cooperative projects with military installations, the use of the 200-bed civil defense emergency hospital, disaster plans for hospitals, and MEND activities in metropolitan areas.

The third symposium, dealing with "Submarine medicine and the habitability of confined environments" will be conducted on April 17-19, at the U. S. Naval Submarine Base in New London, Conn.

China Medical Board Makes Award

The China Medical Board of New York, Inc., has named Dr. Kenneth L.

Duke, associate professor of anatomy, Duke University School of Medicine, as the recipient of the Alan Gregg Travel Fellowship in Medical Education for 1961. Dr. Duke plans to make a comparative histological study of the ovaries of mammals in Southeast Asia. He will spend approximately six months in this area, mostly at the University of Malaya.

The Alan Gregg Travel Fellowship in Medical Education was established in the fall of 1959 to honor the memory of Alan Gregg, an international leader in medical education until his death in June, 1957. The award for 1960 went to Dr. W. O. Reinhardt, professor of anatomy and head of the department at the University of California School of Medicine, San Francisco. A third award will be made for 1962. Applicants must be U. S. citizens between the ages of 30 and 55 and must hold a full-time position on the faculty of a U. S. medical school. Inquiries should be addressed to the Director, China Medical Board of New York, 30 E. 60th Street, New York 22, N. Y. The closing date for applications for the 1962 award is December 15, 1961.

Brown Weighs Possibility of Medical School

The possibility of Brown University establishing a medical school will probably be weighed at its June meeting by the university corporation.

Dr. Barnaby C. Keeney, president of the university, and Dr. Glidden L. Brooks, director of the university's Institute for Health Sciences, revealed that a study has been going on since last June of the likelihood of establishing such a school. Two study panels and six consultants, all "people of importance in the field of medical education," according to Dr. Brooks, have been examining various aspects of such a plan. Among the topics under study are said to be whether it would be financially feas-

ible for Brown to establish a medical school; what kind of medical school would be most practicable and useful; how much money it would take for the kind of program deemed most desirable, and where the money would come from.

The exploration is being conducted under a \$30,000 grant from the Commonwealth Fund.

New Program at Institute of Biological Sciences

A new program of international, interdisciplinary scientific conferences has been initiated at the American Institute of Biological Sciences, directed by Dr. Frank Fremont-Smith, for many years medical director of the Josiah Macy, Jr. Foundation. Offices of the new Interdisciplinary Conference Program are at the Time & Life Building, Rockefeller Center, New York City.

These conferences will consist of approximately eight series of five annual three-day meetings. Each series will concentrate upon a significant biological problem currently in need of interdisciplinary communication, while each annual meeting, limited to 25 participants, will explore a different aspect of the problem in depth.

New Secretary-General for PASB

Dr. Victor A. Sutter of El Salvador, his country's Minister of Health and Welfare from 1956 to 1958, has been appointed Secretary-General of the Pan American Sanitary Bureau.

The new PASB appointee has a long background in international health. From 1950 to 1956 he served at the Geneva Headquarters of the World Health Organization, first as director of the Divisions of Communicable Disease and Public Health Services, and later as assistant director-general in charge of Advisory Services. From 1947 to 1950 Dr. Sutter served as a public health officer

of the Institute of Inter-American Affairs, in the Special Public Health Service in Brazil. During 1945-46 he was Chief Medical Officer of the United Nations Relief and Rehabilitation Administration in China.

The Pan American Sanitary Bureau is the operating arm of the Pan American Health Organization. Founded in 1902, it is the world's oldest international health organization. Since 1949 it also serves as the W-H-O's Regional Office for the Americas.

Heart Association Holding Courses for Physicians

The American Heart Association has scheduled 20 half-day courses in nine cities throughout the nation in which physicians will be instructed in a new, non-surgical method of restoring the beat to a stopped heart. The first of these teaching sessions was held January 25, in New York City for invited physicians from the upper Atlantic region.

Known as "closed chest cardiac resuscitation," the new technique was described some months ago by a team of Johns Hopkins Hospital scientists. The Johns Hopkins team, which includes Drs. W. B. Kouwenhoven, James R. Jude and G. Guy Knickerbocker, have agreed to serve as instructors for the Heart Association-sponsored courses. In addition, the February issue of the Heart Association's monthly publication, "Modern Concepts of Cardiovascular Disease," will be devoted to an article on this subject by the Johns Hopkins group.

Physicians who wish to attend one of these teaching sessions are asked to communicate with their local Heart Association affiliate. In addition to the opening sessions in New York, courses were scheduled for February 1, in Los Angeles, and subsequently in other cities to be announced.

Individual Membership

in the

Association of American Medical Colleges

In recent years the activities of the Association of American Medical Colleges have expanded far beyond the original considerations of administrative problems to the many and varied problems of medical education as encountered by the entire medical school faculty.

The expansion of activities has been due to the growing complexity of medical education—the swift development of the medical sciences, the rapid accumulation of new knowledge to be taught, the pressure for more graduates, the changing patterns of medical care, and countless other factors.

Because of these factors, the AAMC recognizes the need for a professional organization to represent not only the medical schools but the faculty members of these schools. Through the offering of individual membership, the AAMC provides you with the opportunity to exchange ideas, opinions and information through the Annual Meeting, Teaching Institutes, and other activities of the Association.

The AAMC also encourages you to attend the Annual Meeting, not only to meet with others who are teaching in your field and discussing the educational problems that are peculiar to it, but also with the idea of becoming familiar with the entire field of medical education as one of society's most important enterprises. The time has come when teachers of medicine must meet together and discuss the problems and activities that are peculiar to medicine as education just as they are accustomed to meet and talk about medicine as science.

As an Individual Member you are entitled to receive *The Journal of Medical Education*, the only publication devoted exclusively to medical education. The Journal also carries the latest news from the medical schools and provides a valuable service through its Personnel Exchange column. You receive the yearly *Directory*, the Proceedings of the Annual Meetings, and a monthly newsletter which will keep you informed on items of current interest in the field of medical education, both nationally and internationally.

Individual Membership, at only \$10 a year, is open to any person who has demonstrated a serious interest in medical education over a period of years. All the privileges of membership and a provisional membership card are granted immediately after payment of the \$10 fee, although confirmation must await official action at the next Annual Meeting.

To obtain membership, fill out the application form below, append check for \$10, and return to the Association's central office at 2530 Ridge Ave., Evanston, Ill.

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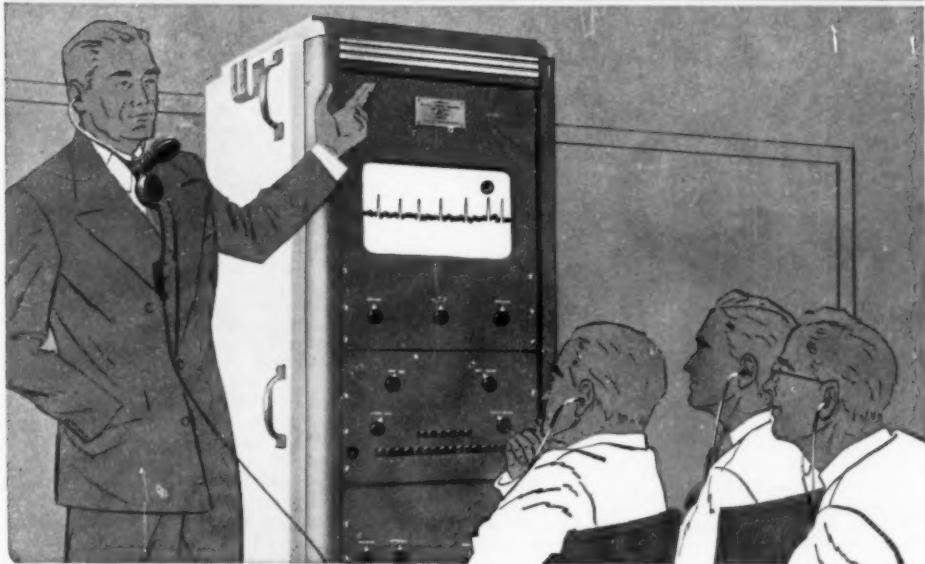
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Faculty Vacancies

MICROBIOLOGIST: Research and teaching in medical school in the Northeast. Background in virology preferred. Opportunity for independent research. The rank is that of instructor, with salary dependent on qualifications. Address: V-103.

PEDIATRICIAN: Full-time instructor or assistant professor with salary based on training and experience. Can build own interest in newly reorganized department of a rapidly developing private university. Mail curriculum vitae to T. R. Pfundt, M.D., Chairman, Department of Pediatrics, The Creighton University School of Medicine, 302 N. 14th St., Omaha 2, Nebr.

INTERNALIST: Certified in Internal Medicine, preferably with Fellowship, for consultant practice in a teaching hospital in Ontario, Canada. Office and secretarial assistance provided. Basic salary and salary ceiling to be arranged. Address: V-104.

HEALTH-PHYSICIST-BIOPHYSICIST: To assume major responsibility for health physics teaching and research in large Eastern university's radiation health program for medical and public health graduate students. Full-time faculty position with independent research and consultation opportunities. Salary and rank dependent on academic qualifications and experience. Send curriculum vitae. Address: V-105.

PATHOLOGIST: Midwest medical school. Teaching of anatomical and clinical pathology. Interest and experience in research desirable. Academic rank based upon qualifications. Salary with consultation privileges. Address: V-106.

MICROBIOLOGIST: Applications are invited for consideration to a position as departmental chairman and professor of microbiology at the State University of South Dakota School of Medicine, Vermillion, S.D. Correspondence may be directed to the Office of the Dean.

ASSOCIATE PATHOLOGIST: VA General Hospital associated with Duke University School of Medicine seeks a pathologist certified in clinical pathology who will direct residents in clinical pathology and will carry on research in one of the branches in clinical pathology. Faculty appointment appropriate for qualifications. Expanding research program. Salary \$14,041 to \$17,200. Write to Roger Baker, M.D., VA Hospital, Durham, N.C.

ANESTHESIOLOGIST: Full-time appointment as Assistant Chief VA Hospital

closely affiliated with medical school. Opportunity for teaching, research, and clinical experience in all physician service. Full resident staff. Licensure (but not necessarily in Utah) required. Prefer board certification. Salary depends on qualifications, \$10,635 to \$15,790 plus other benefits. Include curriculum vitae or VA application in letter. Contact: Carter M. Ballinger, M.D., Division of Anesthesiology, University of Utah, Salt Lake City, Utah.

PHYSIOLOGIST: Applications are invited for the position of Assistant Professor of Physiology, salary dependent on qualifications, \$6,000 minimum. Preference will be given to applicant with special knowledge of biophysics. Opportunity for research. Teaching duties not excessive. Apply to Dr. C. B. Weld, Head, Department of Physiology, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada.

MEDICAL EDUCATION CO-ORDINATOR: Thoroughly progressive midwestern private general hospital seeks a full-time M.D. possessing extraordinary knowledge of the basic sciences, disease entities, teaching responsibilities plus capacity to utilize qualified members of present staff. Must have experience of teaching principles as applied to intern and resident programs in hospitals, university medical schools or non-university teaching hospitals. Address: V-107.

PREVENTIVE MEDICINE: Full-time appointment, with epidemiologic orientation desired for teaching program with opportunities for research participation and development. Some background in public health or community organization desirable. Interest in teaching should be primary. Rank and salary based on qualifications and ability. Address, Jonas N. Muller, M.D., Chairman, Department of Preventive Medicine, New York Medical College, Fifth Avenue at 106th Street, New York 29, N.Y.

CLINICIANS-MEDICAL EDUCATORS: Short term visiting clinical faculty needed by U.S. Midwestern school of medicine to serve as lecturers at overseas postgraduate medical sciences institute, and to lecture on tour of medical colleges and hospitals of this Middle Eastern country. University Contract-U.S. Technical Aid Program. Need for clinical professors in various fields, well-oriented in basic medical sciences. Mature years and teaching experience essential. Appointment for any three-month period beginning February, 1961 through May, 1962, exclusive of June, July, August. Salary, cost of travel by air, and limited allowances. Address: V-108.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

Personnel Available

PHYSIOLOGIST-BIOCHEMIST: Ph.D., faculty member Medical School. Experienced with isotopic and biochemical techniques applied to basic problems in endocrinology, metabolism, and cellular physiology. Publications and societies. Teaching experience. Desires career faculty appointment in physiology or biochemistry with opportunity for independent research. Address: A-463.

PHYSIOLOGIST: M.D., age 35, male, family. Currently in charge of course as associate professor of physiology in Latin American medical school. Approximately 5 years experience in pathology and research laboratories in U.S. Desires teaching position in physiology at U.S. Medical School. Address: A-464.

GENERAL and THORACIC SURGEON: Certified both Boards and eight years training including research fellowships. Experience includes cardiac surgery. Desires academic position with opportunity for research; minimal clinic load to remain familiar with problems in applied surgery. Administrative responsibilities easily accepted. Address: A-465.

NEUROLOGICAL SURGEON: Age 36, unmarried. Desires academic position for clinical investigation with access to teaching and research. Would also consider a position in a City, County, or Federal Institution affiliated with a medical school. Address: A-467.

PATHOLOGIST: Widely experienced, Board Diplomate (P.D.), associate professor, director of laboratories. Desires teaching position with a minimum of administrative responsibility. Available Fall of 1961. Address: A-468.

PATHOLOGIST: Age 37. Certified in clinical and anatomical pathology. Presently on medical school faculty. Desires to combine directorship of hospital laboratory with teaching or hospital educational program. Administrative experience. Address: A-469.

SURGEON—THORACIC: Age 35, four children. M.D., 1951. A.O.A. Medical school residency five years. Diplomate American

Board of Surgery and Thoracic Surgery. F.A.C.S. Desires position in surgical department of medical school, with emphasis on teaching and clinical work with opportunity for research. Wishes to locate in South-eastern section of U.S. Address: A-470.

PARASITOLOGIST—PUBLIC HEALTH: Ph.D., M.S. (Zoology), M.S.P.H. Age 32, married. Desires permanent position involving teaching and research. Experience includes teaching medical parasitology and bacteriology. Currently at work on a full year post-doctoral training program in parasitology. Available July 1, 1961. Address: A-471.

SURGEON: Age 34, M.B., B.S. (Univ. of London), F.R.C.S. (England). Wide experience in general surgery and teaching. Eight years postgraduate training in teaching hospitals, including one year in basic science and research and one year as surgical resident in Canadian teaching hospital. Seeks full-time surgical appointment in U.S. medical school. Address: A-472.

PEDIATRIC CARDIOLOGIST: Age 39, qualified for examination by American Board of Pediatric Cardiology. Now full-time, desires half-time university appointment. Catheterization laboratory necessary. Address: A-474.

MEDICAL ADMINISTRATOR: Harvard trained, Ph.D. Seeking position as medical school administrator-graduate school Dean. Board experience in administration, teaching, research and writing. Author and co-editor of several well-known medical books. Vast experience in basic subjects and clinical subjects at Harvard and Harvard hospitals. Numerous publications. Address: A-475.

PHYSICIAN-PHYSIOLOGIST: M.D., Ph.D. Age 50. Extensive experience in cardiopulmonary research, clinical and laboratory; teaching and administration; numerous publications; research grants. Desires position with responsibility to develop research and teaching program. Address: A-476.

PHYSICIAN: M.D., D.P.H. Extensive experience in epidemiological research, teaching and administration in academic and health department settings. Published

articles; book in preparation. Seeks senior university appointment offering opportunities in broad field of preventive medicine. Address: A-477.

INTERNIST: M.D., Ph.D. Currently Assistant Professor of Medicine with administrative and teaching responsibility for attending and house staff and medical students on large medical service. Active, well-supported, independent research program. Training includes NIH and the University of Chicago. Numerous publications. Desires geographic full-time position or equivalent in medical school or affiliated hospital with facilities for expanding both clinical and laboratory aspects of research program. Address: A-478.

INTERNIST: Certified; also certified in cardiovascular disease. Experience in medical school teaching as assistant professor at student, intern, resident and practicing physician level. Desires full-time position in teaching or community hospital and/or medical school. Address: A-479.

INTERNIST-CARDIOLOGIST: Board certified. Age 35. One year training in clinical cardiology and one year in cardiovascular laboratory—Harvard and Mayo Clinic. Now university instructor in England, returning shortly to U.S. Interested in practice, teaching, director of medical education. Address: A-480.

PATHOLOGIST: Age 56. Voluntarily retiring as professor and department head, University Medical Center, July 1, 1961. Twenty years teaching experience. Thoroughly experienced in service work. Desires position as teacher combined with service work, preferably surgical pathology. Address: A-481.

PATHOLOGIST — ADMINISTRATOR: Pathologist with excellent full-time academic background in administration, medical education, research and service responsibilities. Experience includes professorship and chairman department of pathology, development of research, curriculum, teaching methods, services, and coordinated medical school activities. Extensive publications. Desires teaching position with opportunity to aid in development. Eastern location preferred. Address: A-482.

INTERNIST: Certified. Age 35. Currently on faculty of Eastern medical school. Experience in private practice and administrative medicine. Desires appointment in teaching hospital and/or medical school with opportunities for clinical research in cardiovascular disease and administrative responsibilities. Address: A-483.

PSYCHIATRIC SOCIAL WORKER: Female, M.S., personal psychoanalysis. Three years experience in delinquency problems. Current appointment in medical school involves participation in clinical and teaching program in department of psychiatry. Desires similar position or other psychiatric clinical appointment. Southern California preferred. Available July 1, 1961. Address: A-484.

INTERNIST: Age 34, single, male. Currently on faculty of British Colonial medical school. Postgraduate training in clinical medicine and research. Experience in cardiac catheterisation and haemodynamic investigations; also in life insurance medicine and some private consultative practice. Numerous publications. Desires faculty appointment or fellowship with opportunity for cardiological investigation. Address: A-485.

OBSTETRICIAN-GYNECOLOGIST: Age 35, PBK. AOA. Desires head administrative appointment in medical school or affiliated hospital, with opportunity to develop department. Ability in creative research, teaching, and operative gynecology. Institution must allow to be earned or pay a minimum of \$30,000. Address: A-486.

SURGEON-THORACIC: Age 34. Currently engaged in thoracic surgery residency training which includes all phases of pulmonary resectional surgery. Wide experience in heart surgery. Desires full-time medical school appointment, balanced between teaching, research, and dog laboratory research. Address: A-487.

MICROBIOLOGIST: Ph.D. Many years experience in clinical bacteriology and mycology. Excellent background in parasitology and virology. Well qualified in many phases of public health microbiology. Medical school and A.S.C.P. teaching experience as well as administrative responsibilities. Publications. Desires challenging appointment in medical school. Address: A-488.

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